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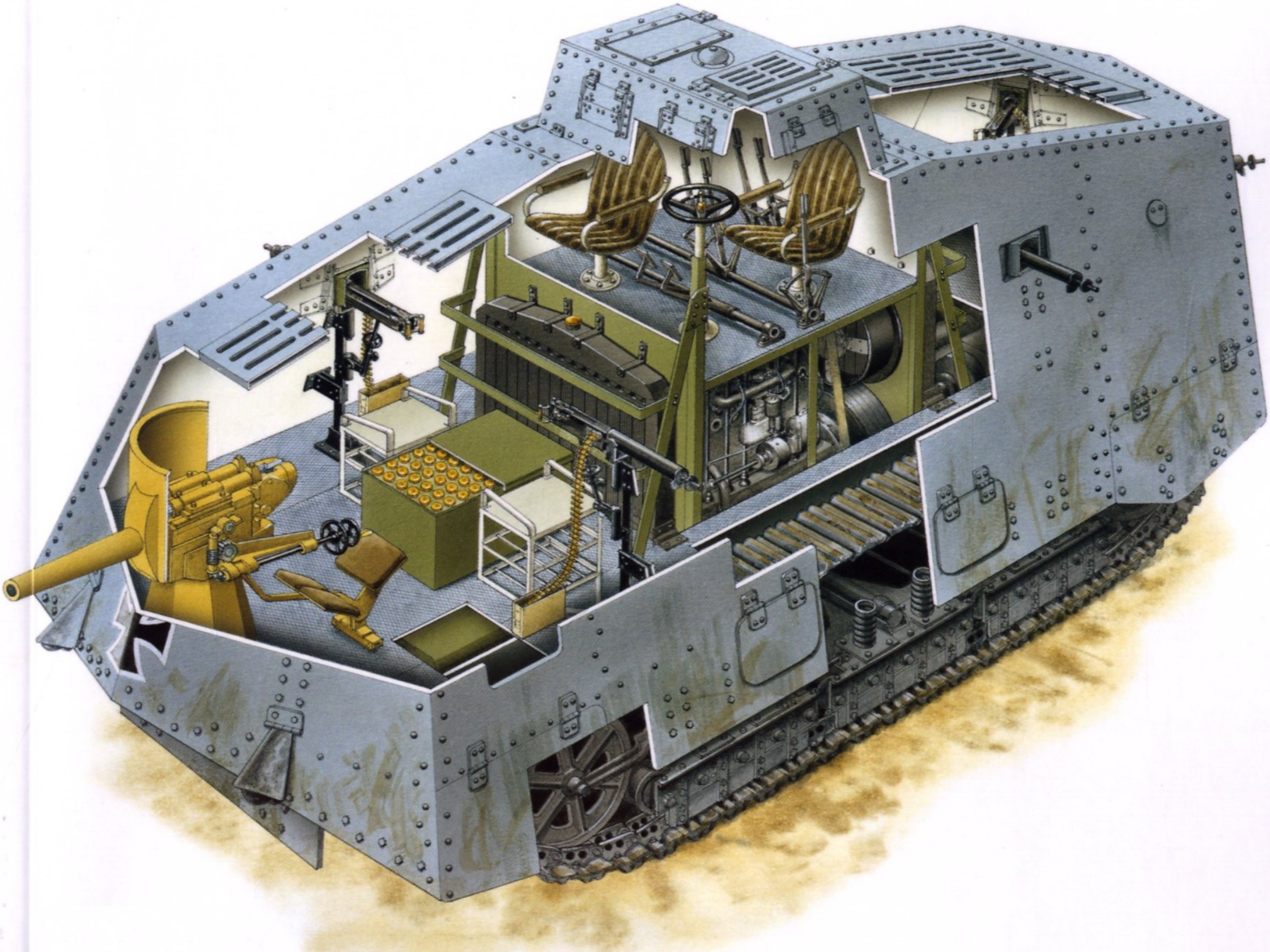
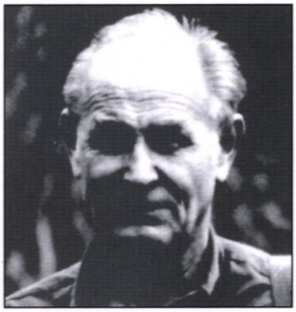
German Panzers 1914–18



Steven J Zaloga • Illustrated by Brian Delf

STEVEN J ZALOGA received his BA in history from Union College and his MA from Columbia University. He has worked as an analyst in the aerospace industry for over two decades, covering missile systems and the international arms trade, and has served with the Institute for Defense Analyses, a federal think-tank. He is the author of numerous books on military technology and military history, including many about armored vehicle development.



BRIAN DELF began his career working in a London art studio, producing artwork for advertising and commercial publications. Since 1972, he has worked as a freelance illustrator on a variety of subjects, including natural history, architecture, and technical cutaways. Some of his recently illustrated books have been published in over 30 countries. Brian lives and works in Oxfordshire.

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First published in Great Britain in 2006 by Osprey Publishing, Midland House,
West Way, Botley, Oxford OX2 0PH, UK
443 Park Avenue South, New York, NY 10016, USA
E-mail: info@ospreypublishing.com

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A CIP catalog record for this book is available from the British Library

ISBN-10: 1 84176 945 2
ISBN-13: 978 1 84176 945 5

Page layout by Melissa Orrom Swan, Oxford, UK
Index by Ingrid Lock
Typeset in Helvetica Neue and ITC New Baskerville
Originated by PPS Grasmere Ltd, Leeds, UK
Printed in China through Worldprint Ltd.

06 07 08 09 10 10 9 8 7 6 5 4 3 2 1

For a catalog of all books published by Osprey Military and Aviation please contact:

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Author's note

My interest in this subject was started over 20 years ago through correspondence with Max Hundleby of the Miniature Armored Fighting Vehicle Association (MAFVA), to whom I owe a belated nod of appreciation. Thanks also go to Thomas Anderson of Panzerpixel, Charles Lemons and Candace Fuller of the Patton Museum at Ft. Knox, Kentucky, and the staffs at the US Army Military History Institute (MHI) at the US Army War College, Carlisle Barracks, Pennsylvania, and the US National Archives and Records Administration (NARA) at College Park, Maryland, for assistance in gathering the photos used in this book.

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Brian Delf, 7 Burcot Park, Burcot, Abingdon, Oxon, OX14 3DH, UK

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Glossary

AKK(R) 111	Armee Kraftwagen Kolonne (Raupe) 111; Army Motor Vehicle Convoy (Tracked) 111
APG	Aberdeen Proving Ground, Maryland
BAKP 20	Bayerishcer Armee Kraftwagen Park 20; Bavarian Army Motor Vehicle Park 20
Bocklafette	trestle gun mount
Buntfarben-anstrich	multicolor paint
Chefkraft	Chef des Feldkraftfahrwesen; Chief of Tactical Vehicles
feldgrau	field gray
Funkpanzer	radio-tank
LK	*leichte Kampfwagen*; light combat vehicle
Motorgeschütz	motorized gun
OHL	Oberste Heeres-leitung; Supreme Army Command
Panzerkampfwagen	armored fighting vehicle
Panzerkraftwagen	armored motor vehicle
PzKw-MG-Zug	Panzerkraftwagen-MG-Zug; Armored Motor Vehicle MG Platoon
QF	quick-firing
Radpanzer	armored car
Shützengrabenbagger	trench-digging machine
Sockellafette	pedestal gun mount
Sturmbataillon	Assault Battalion
Tankbergungsstelle Cambrai	Tank Recovery Command – Cambrai
TUF	*Tank und Flieger*; tank and air
Überlandwagen	cross-country vehicle
VPK	Verkehrstechnische Prüfungs-kommision; Motor Transport Inspection Service

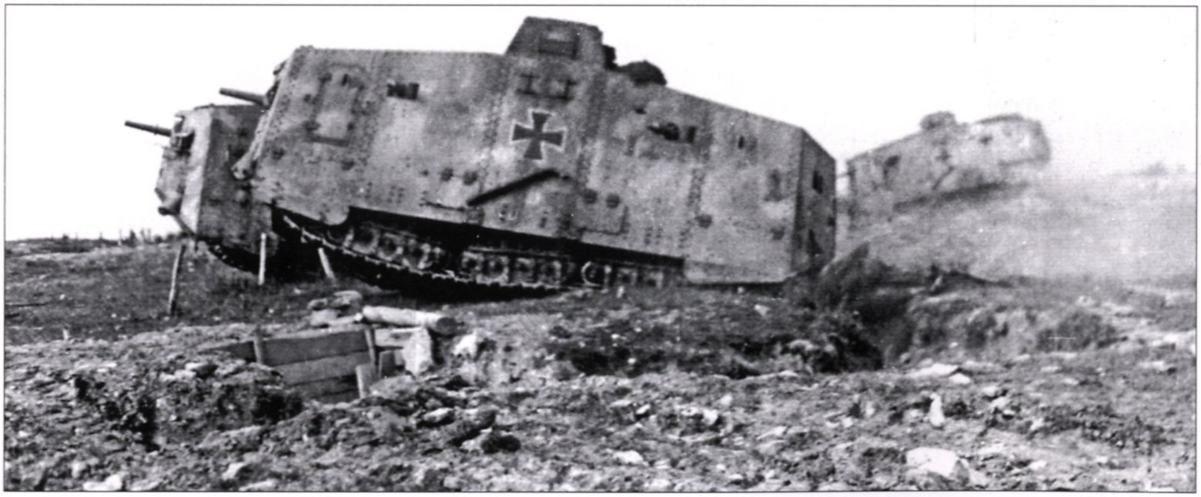
GERMAN PANZERS 1914–18

INTRODUCTION

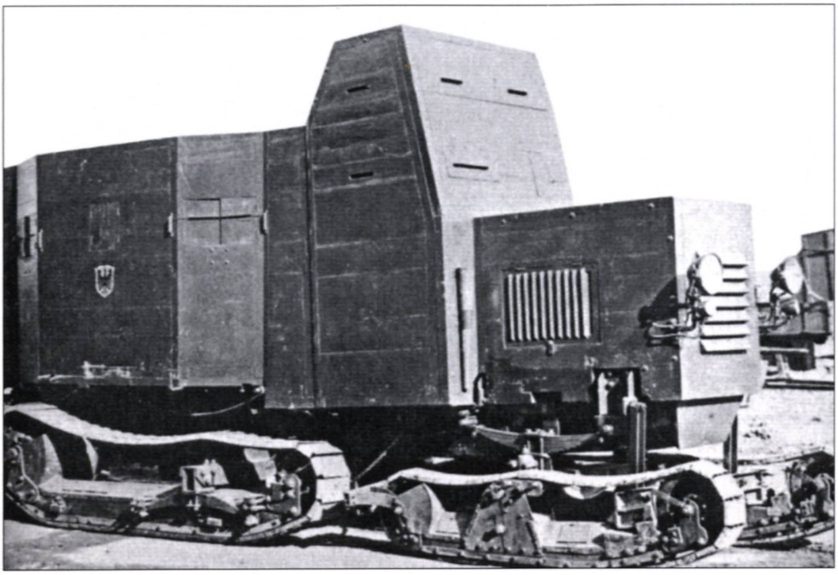
In view of the central role that the Panzer played in the Wehrmacht's blitzkrieg campaigns of World War II, the small size of the World War I Panzer force is surprising. Compared to the other great powers, the German Army in World War I showed little enthusiasm for armored vehicles of any kind. Armored vehicle development started a few years later than was the case in Britain, France, and Russia, and a series of serious technical misjudgments in 1916–17 further compromised tank development in Germany during the Great War. As a result, tank production started very late and on a very small scale – less than two dozen A7V tanks were produced in Germany, compared to over 8,000 tanks in Britain and France. As a result, the German Army used more captured British tanks than their own A7V tanks in the 1918 battles. By the end of the war, however, the German Army's attitude had changed and many new tanks were under construction, including the world's largest tank, the German K-wagen heavy tank.

EARLY ROOTS

The idea of harnessing motor power for the construction of combat vehicles was widespread amongst inventors in Europe during the early 1900s. Two forms of armored fighting vehicles predominated: the armored train and the armored car. Both relying on existing technology, they suffered from significant mobility restrictions. In Germany several



Panzer attack. A dramatic view of a trio of A7V tanks during a training exercise in the summer of 1918. (NARA)

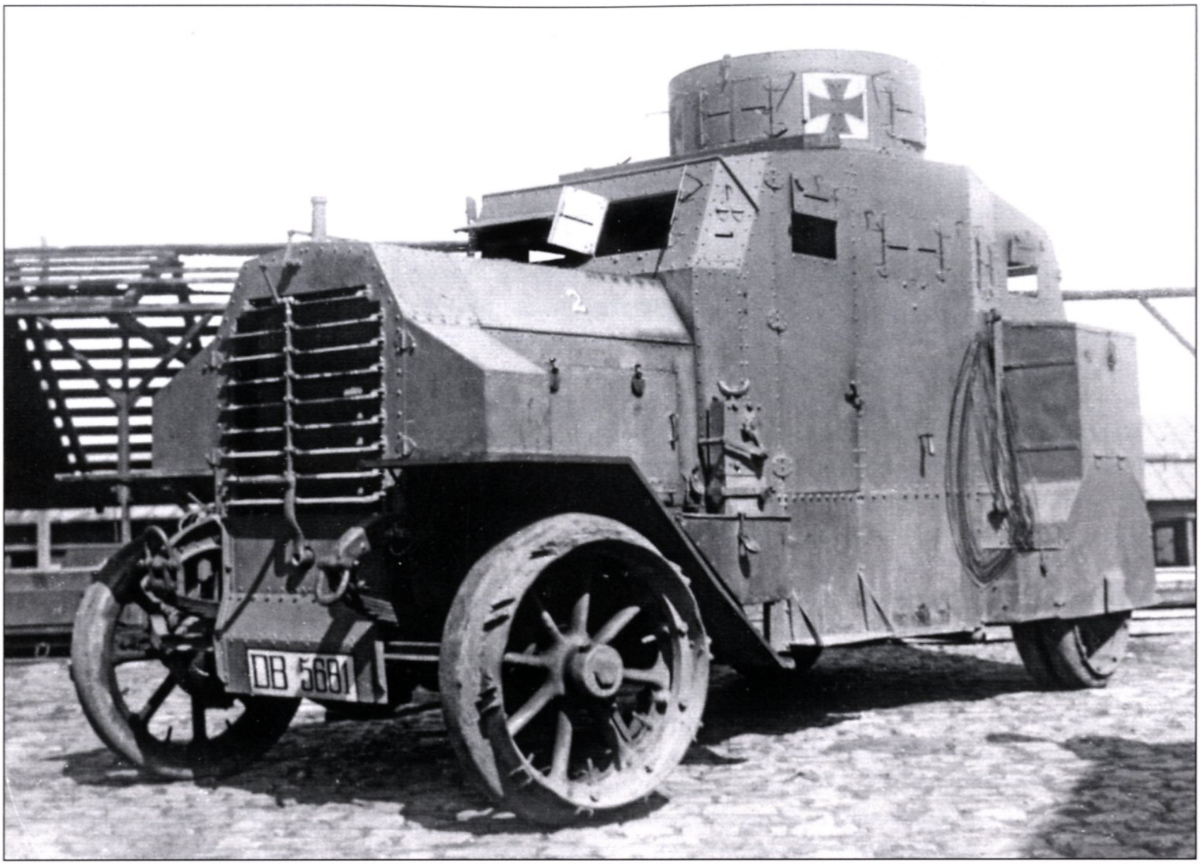


The first serious German effort to develop an armored fighting vehicle was an armored version of the tracked Bremer-Marienwagen. Even with only a mocked-up wooden superstructure, it proved to be hopeless in cross-country travel. (Patton Museum)

firms, including Daimler, Opel, and Erhardt, developed armored cars on their own initiative. While the German military inspected several of these vehicles, there were no orders, since there was no strong tactical requirement. The early armored cars were essentially road-bound, since their heavy armor, narrow wheels, and modest engine power made them very vulnerable to becoming bogged down during cross-country travel. The other principal form of early armored fighting vehicle was the armored train, examples of which can be traced back to the US Civil War and the Franco-Prussian War of 1870. This type of combat vehicle attracted far more interest in Eastern Europe than in Western Europe and both Austria-Hungary and Russia had begun to deploy sophisticated designs with gun armament by the time that World War I broke out in 1914. However, the German military showed little interest in such weapons.

The idea of using an armored tracked vehicle instead of a wheeled or rail vehicle sprouted up in many locations during the early 1900s. An Austrian officer, Gunther Burstyn, outlined the design of a *Motorgeschütz* (motorized gun) in an article in 1912, but the army lacked the resources or interest to pursue the idea. A further impediment to later German development of tanks was the lack of interest shown in tracked prime movers such as the Caterpillar-Holt designs, which later proved to be the catalyst for other early tank designs, especially in France.

The German Army did not begin to show serious interest in armored fighting vehicles until initial encounters with Belgian, British, French, and Russian armored cars during the first months of the war. On November 3, 1914, the German Army placed orders for the construction of a prototype *Radpanzer* (armored car) from three automotive firms – Daimler-Untertürkheim, Büssing, and Erhardt. The Daimler/15 was based on a large truck chassis with an 80hp (58kW) engine and was fitted with cupolas and side ports for several machine guns. The prototype was the first to be delivered, in October 1915. Büssing designed its much larger A5P with a 90hp (66kW) engine, armed with a similar profusion of machine gun ports in the top cupola and side ports. The Erhardt E-V/4 had a configuration more similar to the Daimler than the Büssing. All three



The only type of German armored car to reach serial production was the Erhardt E-V/4 in 1917. Most of these saw service in 1918 in Russia on occupation duty, which is when this one is seen in Rostov. (NARA)

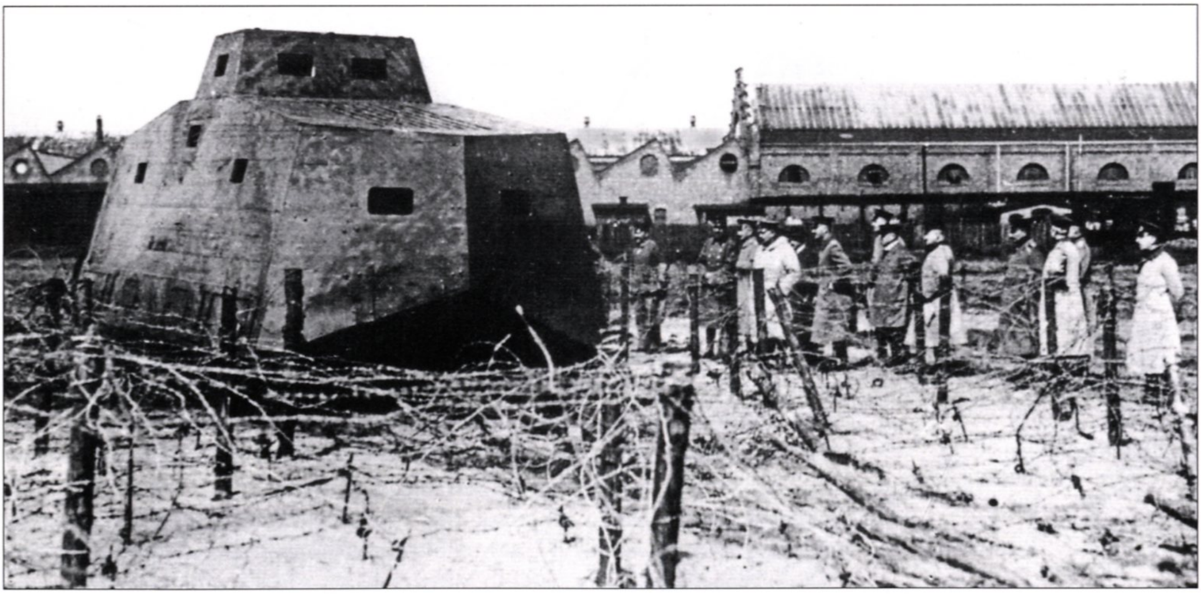
prototypes were eventually delivered to the new Panzerkraftwagen-MG-Zug 1 (Armored Motor Vehicle MG Platoon 1), starting with the Daimler in March 1916. However, this unit was deployed through most of 1916–17 on the quiet Alsace front, so there were few opportunities for armored cars to prove their combat value and encourage serial production.

THE EARLY TANK PROGRAM

British Mark I tanks first appeared in combat on the Somme in September 1916. The tanks penetrated German lines near Flers in small numbers, but had little overall effect on the battle due to their mechanical problems and the difficulty of crossing trenches and shell-pocked terrain. The German Army was not entirely unaware of the idea of using tracked vehicles to cross terrain, and in fact some modest programs were already underway. Frederich Göbel proposed a "wheel-less/rail-less" vehicle to the German Army's Technical Communications Testing Committee in February 1914 as a means of cross-country travel. This was not a true tracked vehicle, but rather a mechanized walker with six sets of mechanized feet. A sub-scale model was demonstrated in 1914, but when the war broke out, Göbel ended up in uniform, stopping the project. In 1915 he proposed to adapt his vehicle as an armored land cruiser, and was allotted about 50,000 marks to build an experimental example. When initially demonstrated in January 1916, it made a first step and then broke down. In disgust, the German Army withdrew its support. Another engineer, Hugo Bremer, proposed to convert Daimler Marienwagen trucks into cross-country vehicles by substituting a simple set of tracked bogies for the wheels. This was somewhat similar to later Kegresse half-tracks, except that four bogies were used instead of two, with the two rear assemblies being powered. A prototype Bremer-wagen was tested in Westphalia in October 1916, leading to an order from the Prussian War Office for 20 vehicles. There were a number of other wheeled and tracked cross-country vehicles also under consideration at the time.

In the wake of the first encounters with British tanks, the Oberste Heeres-leitung (OHL; Supreme Army Command) began to press the Prussian War Ministry for a German tank. Gen Friedrich of the Verkehrstechnische Prüfungs-kommision (VPK; Motor Transport Inspection Service) sponsored an industrial conference on October 30, 1916 with representatives of the main German automotive and industrial firms to solicit interest in designing such a weapon. The industrial firms showed little interest as the government was in the process of implementing the "Hindenburg program," a set of ambitious objectives for increased military production. The German economy was already feeling the strain of war, and unless a project was part of the new program, it had little chance of receiving allocation of high-priority resources such as armored plate. The program was directed by LtCol Max Bauer, who headed the OHL staff. Bauer was an ambitious political intriguer who had the ear of the key German leaders, especially the army chief of staff Field Marshal Paul von Hindenburg, and his principal aide, Gen Erich Ludendorff. Germany's weapons procurement system was not as centralized as that found in either Britain or France. It consisted of a Prussian core with various federal agencies appended to it, oftentimes leading to duplication of responsibility for programs and uncertain authority. Elaborate programs developed within the weapons procurement bureaucracy were often derailed by interference from the influential OHL.

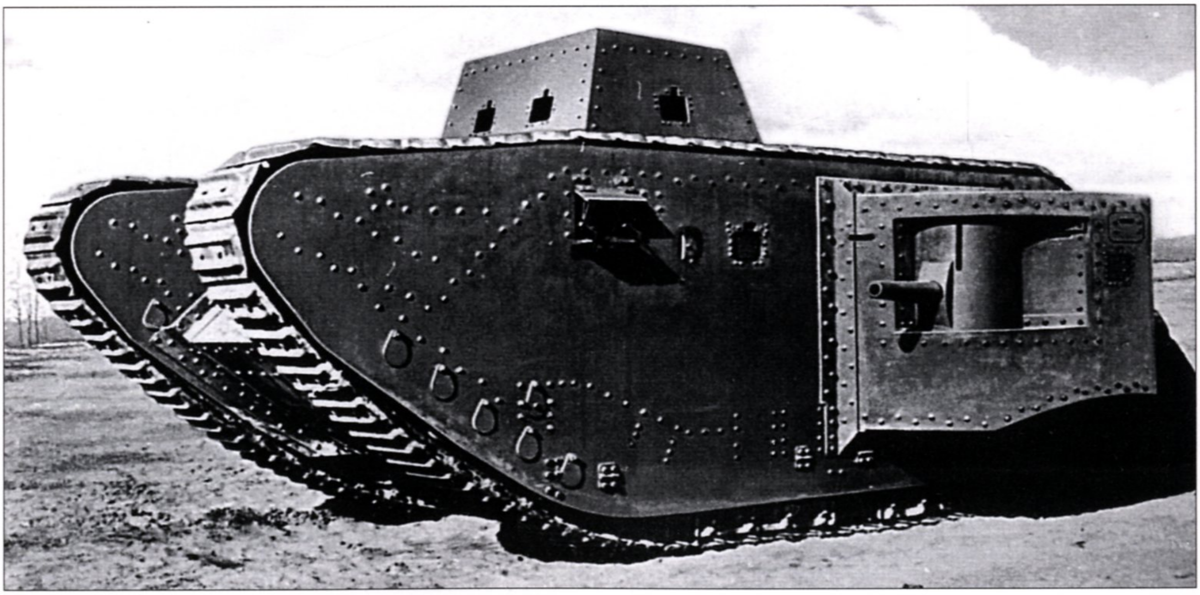
The A7V prototype with a mocked-up wooden hull is demonstrated for Kaiser Wilhelm II at the Daimler factory in Berlin-Marienfelde on June 19, 1917. Although not evident here, the prototype was fitted with a small unditching tail at the rear that did not carry over to the production tanks. (Patton Museum)



Although Gen Friedrich did not elicit much enthusiasm from the German automotive industry, he was able to establish a committee, the "Abteilung A7V," named after the Abteilung 7 Verkehrswesen (7th Transport Department) of the Prussian War Office, and this was assigned responsibility for the German program. The committee was led by Joseph Vollmer of the VPK, an experienced automotive designer, and included a few representatives from each of the main automotive firms. Ultimately, it was the Daimler firm that showed the most interest in the program. The committee began by studying the Bremer-wagen, Göbel designs, and other proposals, but found none of them to be very suitable. In November 1916, the Prussian War Office formally ordered the construction of a *Panzerkampfwagen* (armored fighting vehicle) under the code-name A7V, but complicated the task to include a related *Überlandwagen* (cross-country vehicle) built on the same chassis. This decision was the first in a series of missteps that compromised the eventual A7V tank. The British rhomboid configuration was very suitable for the trench-crossing combat vehicle, but less attractive for the prime mover. As a result, Vollmer was pushed in the direction of a more conventional tractor suspension for the prime mover requirement, and this would ultimately prove to be the A7V tank's undoing.

To get the tank program underway, a Caterpillar-Holt tractor was purchased from the Austro-Hungarian Army and another private example was seized in Germany. Vollmer worked in conjunction with Eugene Linck from Daimler to adapt the Caterpillar-Holt suspension for the A7V. This suspension concept was actually similar to the French St Chamond and Schneider tanks. The resulting A7V design offered noticeably poorer trench-crossing ability than the existing British tanks, but it was powered by two engines, giving it a better speed of over 9mph (15km/h). Vollmer delivered blueprints of the A7V design in December 1916 and promised a first vehicle could be ready by May 1917 if industrial support was received. The VPK ordered the construction of 100 A7V tanks even before a prototype had been tested.

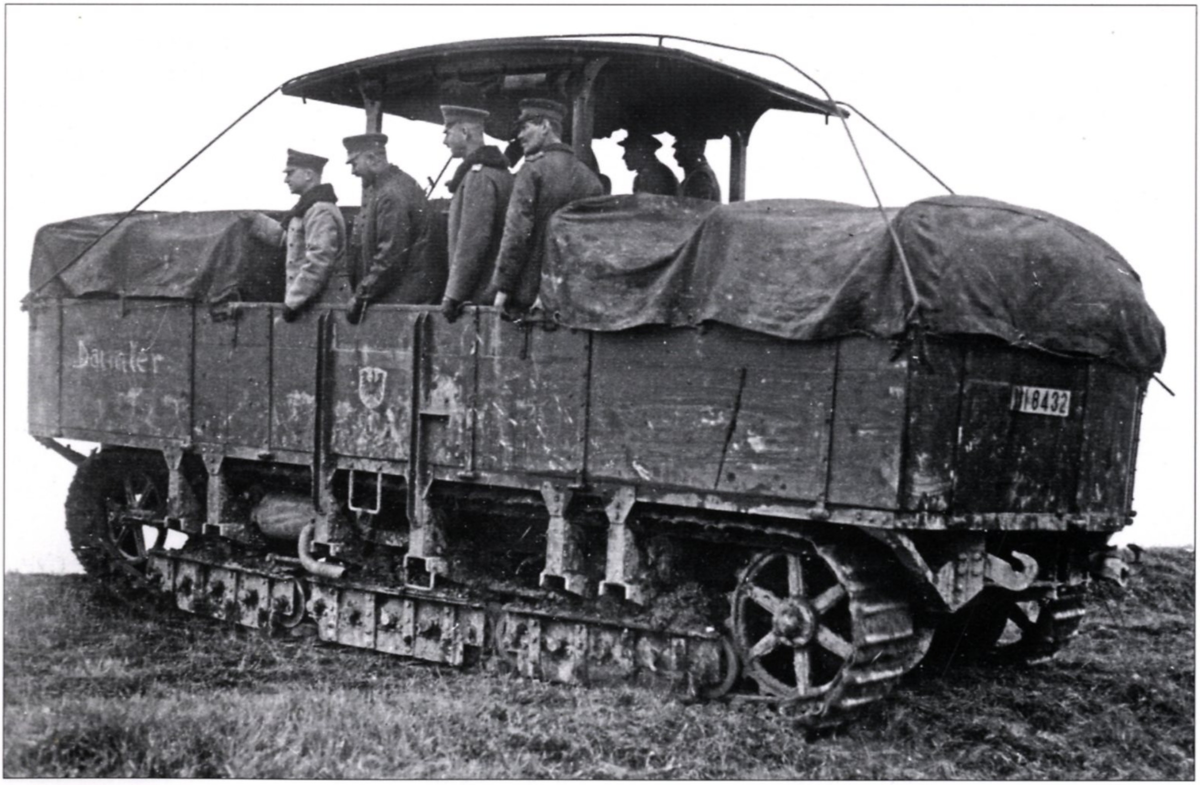
A single A7V chassis was built in the A7V-U configuration, mimicking the British rhomboid tank. Its late completion and poor performance prevented any serial manufacture. (Patton Museum)



In the meantime, the A2 (Infantry) department of the Prussian War Office had come up with their own idea and decided that what was needed was a *Panzerkraftwagen* (armored motor vehicle) to move infantry cross-country under armored protection, not necessarily a gun-armed tank. Since 20 Bremer-wagen tracked vehicles were already on order, the idea emerged to modify these with armored plate. Ten of these cross-country vehicles were to be converted into Marienwagen I mit Panzeraufbau (Marienwagen I with armored superstructure) by February 1917. Sturm Panzerkraftwagen Abteilungen 1 and 2 (Assault Armored Motor Vehicle Units 1 and 2) were created on January 23, 1917, at the Berlin Gardekorps garrison. A mock-up of the armored Marienwagen with a wooden body was demonstrated to the OHL on March 13, 1917, near Mainz with both Hindenburg and Ludendorff present. Even without the full weight of the armored body, the performance was dismal. This unfortunate display led the two most influential leaders of the German Army to frown on future German tank development at the very time that the A7V design most needed vigorous encouragement from the army leadership.

The A7V program floundered through much of 1917 due to conflicting demands from various elements of the army and the program's low priority. On January 20, 1917, the Prussian War Office and OHL decided to undercut the VPK program and ordered that the initial A7V production would be trimmed from 100 to ten tanks. To further complicate matters, the OHL demanded that the armor be significantly strengthened to resist not only machine gun fire, but also artillery fire. It had been evident from the Somme fighting that the new British tanks were vulnerable to field guns, and the OHL wanted this problem to be addressed. Vollmer's team

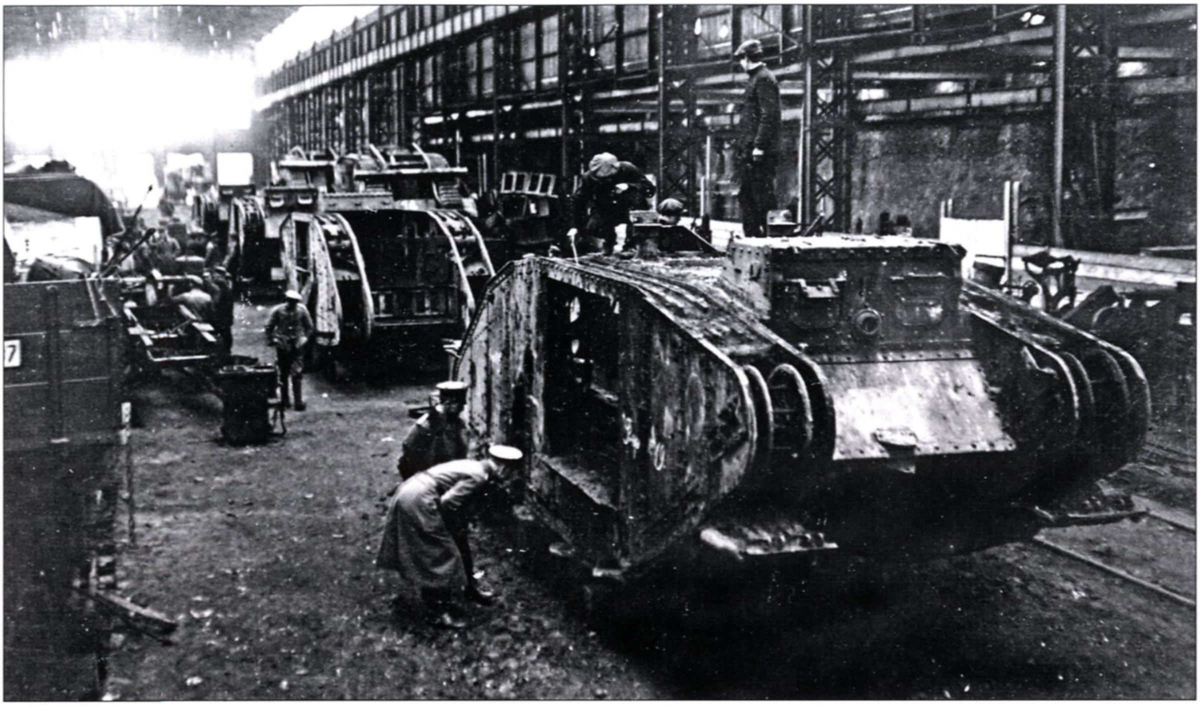
The first version of the A7V to enter production was the Gelandwagen prime mover, designed to bring critical supplies to the frontline troops across rough terrain. (NARA)



had already finished a wooden mock-up of the A7V armored body by mid-January, but the new orders meant that the whole design had to be reconsidered. Increasing the armor depth to 1.18in. (30mm) with the existing design would increase the vehicle's weight beyond its capacity. At first, Vollmer drafted a new design with a smaller superstructure, but soon concluded that the tank would be too heavy even with the reduced size. A compromise was reached with the bow plates being increased to 1.18in. (30mm), and less exposed areas kept to 0.59in. (15mm). This weight increase further compromised the A7V tank performance and made the vehicle nose heavy.

The original plan proposed that the A7V would be armed with the new 20mm Becker TUF (*Tank und Flieger*, tank and air) automatic cannon, but this was dropped in the spring of 1917 when it was discovered that it was ineffective against other armored vehicles and gave poor performance against emplaced enemy machine guns or artillery. Instead, the army decided to follow the British Male/Female pattern and arm most of the tanks with machine guns, and only one in five with a gun. ("Male" tanks were cannon armed, "Female" tanks were machine gun armed.) Various other guns were considered, including a 77mm FK 96 field gun, but it proved excessively powerful for the chassis. Various 50mm guns were examined but Vollmer eventually settled on the 57mm Maxim-Nordfelt QF (quick-firing) fortress gun, since it was an effective weapon with both a solid and high-explosive projectile, and could be readily fitted to the A7V. Built in Britain, numerous examples of the gun had been captured from Belgian fortifications and others were captured from the Russians.

Although British tanks had been first encountered in September 1916, German units did not actually manage to study a tank until April 1917, when a Mark II was knocked out near Quent and extensively photographed. Reports from the field spoke of the excellent mobility of the British tanks, prompting Ludendorff to order that the A7V copy the British rhomboid configuration. Due to the disruption this would cause, the VPK dragged its heels until it was formally ordered on September 1, 1917, to make the changes. The resulting variant was known as the A7V-U (*Umlaufende-ketten*; all-around tracks) but the prototype was not ready until the end of June 1918. At the end of March 1917, the VPK tried to accelerate the A7V program by returning the production plan to 100 vehicles, but this move was denied due to opposition by both the Chef des Feldkraftfahrwesen (Chefkraft; Chief of Tactical Vehicles) and the OHL. The first A7V chassis was ready for demonstration on April 30 at the Daimler test track at Marienfelde and Gen Friedrich of the VPK and the Prussian Minister of War, Gen Oberst Hermann von Stein, were present for the first trial. The vehicle crossed a variety of obstacles that had been created by engineers to simulate typical battlefield conditions. Problems arose when the vehicle executed turns and at one point a track broke. Gen Stein was critical of the vehicle's lack of cross-country ability in muddy conditions and suggested it would only be useful for defensive and not offensive operations. In spite of this viewpoint, a further demonstration was conducted for the OHL near Mainz on May 14, 1917, with the chassis fitted with a wooden mock-up of the armored hull. LtCol Max Bauer, the influential head of the OHL staff, and the Chefkraft, Col Mayer, both attended. The demonstration also included some other proposed cross-country vehicles, the tracked Orion-wagen

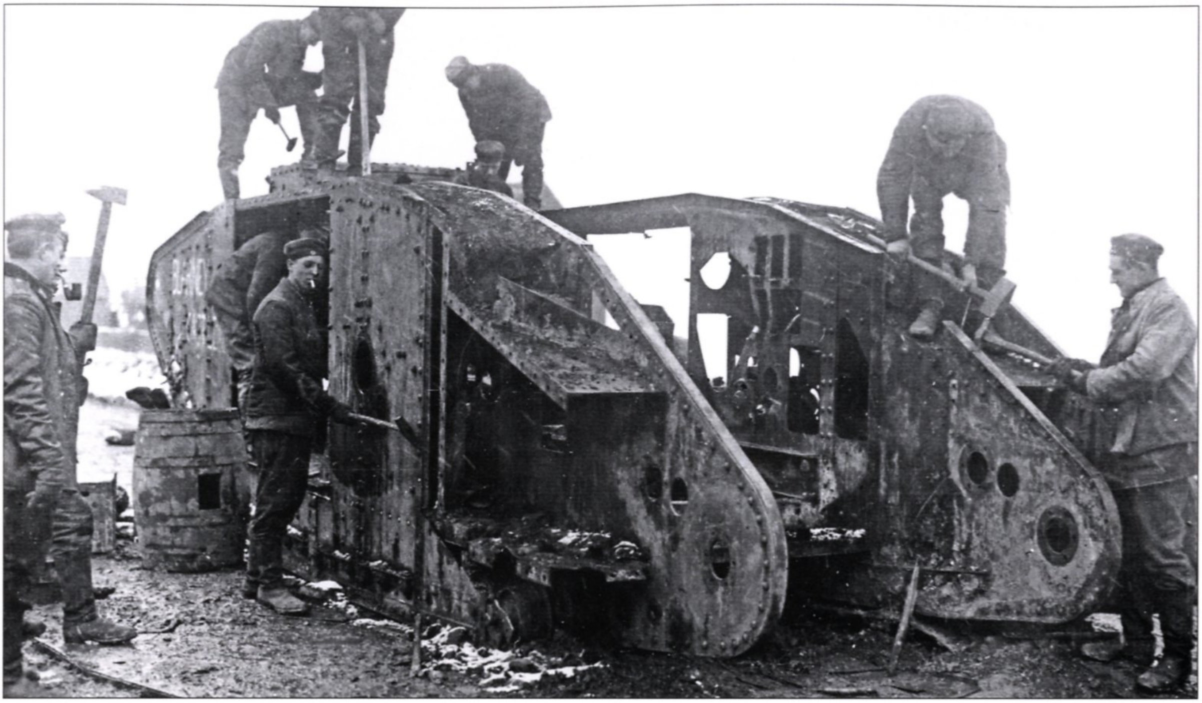


British Mark IV tanks recovered from the Cambrai battlefield were transported to the Germaine plant in Charleroi, where BAKP 20 (Bayerischer Armee Kraftwagen Park 20; Bavarian Army Motor Vehicle Park 20) restored them to working condition before reissuing them to the new German captured-tank units. (NARA)

and Treffass-wagen tricycle tractor among them. Mayer was not well disposed to the A7V, complaining that its configuration was poorly suited to trench crossing, and he favored a monstrous new tank called the K-wagen, patterned after the British style but armed with four 77mm field guns.

Yet the Mainz test in May conclusively demonstrated that the A7V was superior to any of its existing competitors. The commission recommended that two tank detachments be formed from the original ten A7Vs on order, and that another ten A7V armored bodies be ordered as a reserve. Production would be increased to 100 tanks once the A7V had proven itself. Mayer attempted to include ten K-wagen in the plan, but this was rejected by the Prussian War Office. Even though the A7V had now won important approval, Bauer granted the program only Priority II for armor plate. The reasons for the low priority were many. The French had first tried to use their new Schneider tanks at Berry-aux-Bac on April 16, 1917, but suffered very heavy losses to German guns. The strategic plans for 1917 expected that the German Army would remain on the defensive on the Western Front for the rest of the year, so a tank was hardly necessary. German industrial resources were stretched to their limits, and so every new program had to fight to win approval. Bauer knew that Ludendorff was unimpressed, with tanks based on the British and French tank actions, and the dismal Marienwagen.

Concerns over the A7V's limitations led to continued efforts with the Chefkraft's K-wagen heavy tank. A tentative design was drawn up by Capt Wegner of the Chefkraft staff. In its original configuration, it was expected to weigh 150 tons (136 tonnes), propelled by two 600hp (447kW) engines, armed with four 77mm field guns, and crewed by 23 troops. After considerable badgering by the Chefkraft, production of ten of these monsters was approved by the War Ministry on June 28, 1917, with



Tanks that were damaged beyond redemption were usually cannibalized for spare parts for other tanks. (NARA)

production to be split by the Riebe ball-bearing plant in Berlin-Weissensee and the Wegmann plant in Kassel. The Chefkraft staff was not capable of undertaking the design on its own, so Joseph Vollmer was brought in to assist. Vollmer was opposed to the design as a waste of resources and during the course of its development, the weight was gradually trimmed back to about 100 tons (90 tonnes), which was still a preposterous size given the technical limitations of the day.

The A7V program wallowed in problems and technical difficulties throughout much of 1917. The production program at the Daimler plant proved much more protracted than expected due to a lack of skilled craftsmen, material shortages, and technical problems with the new tracked suspension. These problems were slowly overcome. By September 1917, the first serial production A7V chassis without armor was ready enough to be sent to the Tracked Vehicle Driving School, a necessary first step in forming the first tank units. The A7V-Gelandwagen proved to be a simpler project, and the first eight vehicles were completed by September 1917. These were deployed with the Armee Kraftwagen Kolonne (Raupe) 111 (AKK[R] 111; Army Motor Vehicle Convoy [Tracked] 111) in northern France in November 1917. The first complete A7V tank, number 501, was finished by the end of October 1917 in the basic machine gun configuration.

The first tank units were organized by the War Office under a September 29, 1917 table, designated as Sturm Panzerkraftwagen Abteilungen, sometimes abbreviated as Stuka. Each unit was equipped with five tanks, four of which were machine gun tanks and one of which was a gun armed tank. The machine gun armed tanks had six machine guns and two flame-throwers, while the gun tanks had a single 57mm gun and four machine guns. Abteilung 1 and Abteilung 2 were formed under the September orders, while Abteilung 3 was added on November 6, 1917.

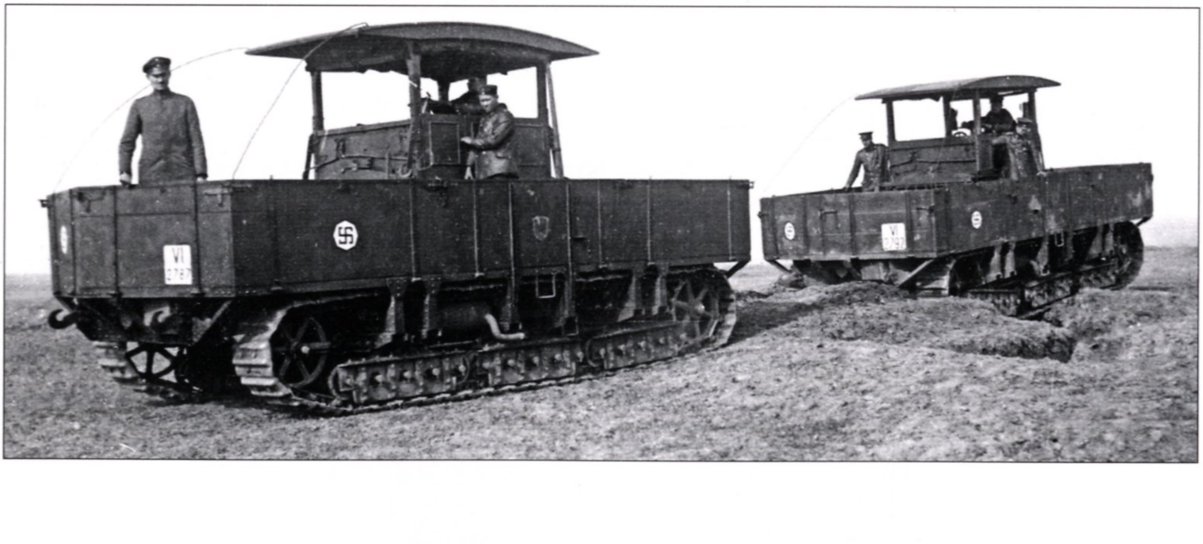
THE CAMBRAI SHOCK

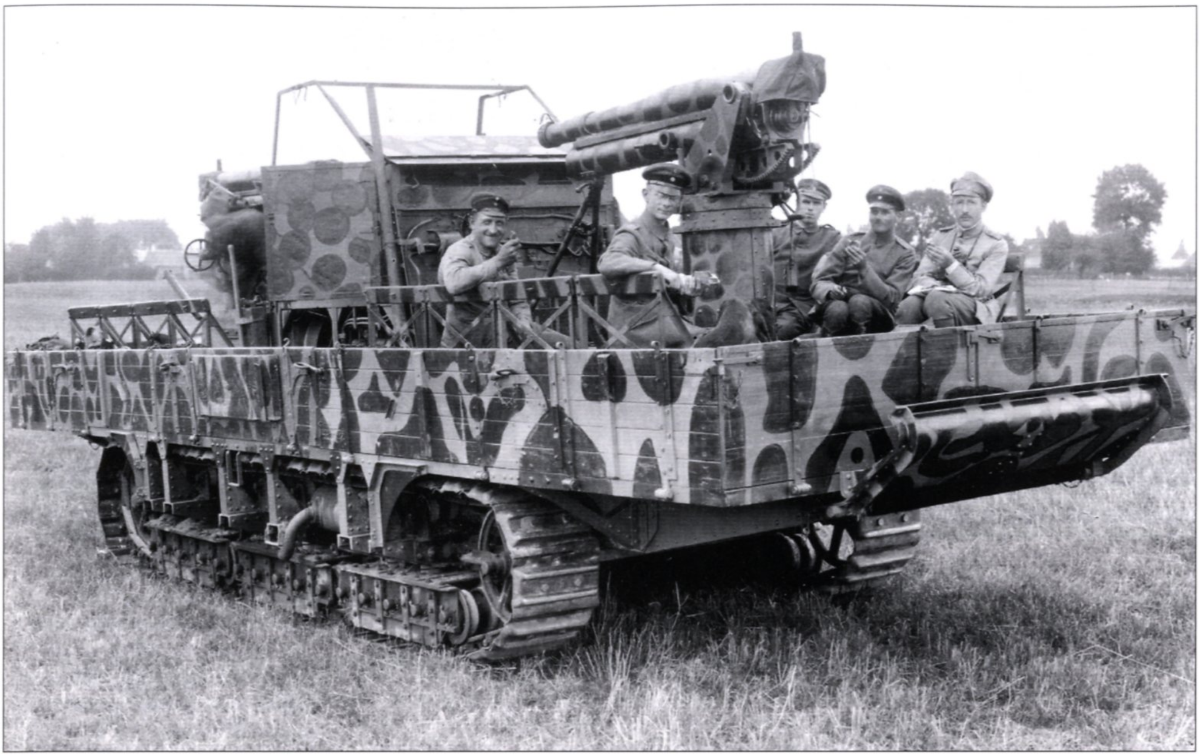
The beleaguered German tank program underwent a complete reversal of fortune following the British tank attack at Cambrai on November 20, 1917. The tank attack broke through German lines to a depth of 5.6 miles (9km) and set off a panic among some German infantry units. Ludendorff completely changed his attitude about the tactical potential of tanks. Further reinforcing his change of heart were the plans that were underway for a major German offensive in 1918. So the tank was suddenly seen as a worthwhile tool for offensive operations. By this stage the production plan for the A7V tank had risen to 40, including two test vehicles. Three tank units were ordered to be ready by February 1918 and were put under the command of Capt Heinrich, Stabsoffizier für Tanks (Stotank). The OHL ordered that the planned armament of the A7V be changed so that all tanks would be armed with the 57mm gun. The OHL also ordered the acceleration of K-wagen production so that three units would be ready by April 1918.

In the meantime, a third type of tank was under development by Joseph Vollmer, the LK I (the LK stands for *leichte Kampfwagen* – light combat vehicle). Vollmer had recognized that the A7V was too large and cumbersome to be built in large numbers, to say nothing of the ridiculous K-wagen. It occurred to him that it would be much better to build large numbers of small tanks than small numbers of large tanks; this viewpoint matched the sentiments of Gen Estienne in France, who had promoted the revolutionary Renault FT light tank. Vollmer's LK I, like the French Renault FT light tank, was a simple design suitable for mass production. The configuration was not as elegant or innovative as the Renault, resembling instead the British Whippet. A proposal on December 29, 1917, to build 500 to 600 of these was rejected by the OHL on the grounds that the armor was insufficient. However, a prototype was authorized which was completed in March 1918.

The German 2nd Army staged a counterattack in the Cambrai sector on November 29, 1917, that erased the British salient and managed to capture about 100 British tanks. Most of these were damaged, but they offered the potential of rapidly expanding the infant German Panzer force with a proven tank design.

A pair of A7V Gelandwagen in service with the AKK(R) 111. Neither vehicle is carrying a load and this is probably a training exercise. The swastika in a white octagon insignia was the AKK(R) 111 tactical symbol. (NARA)



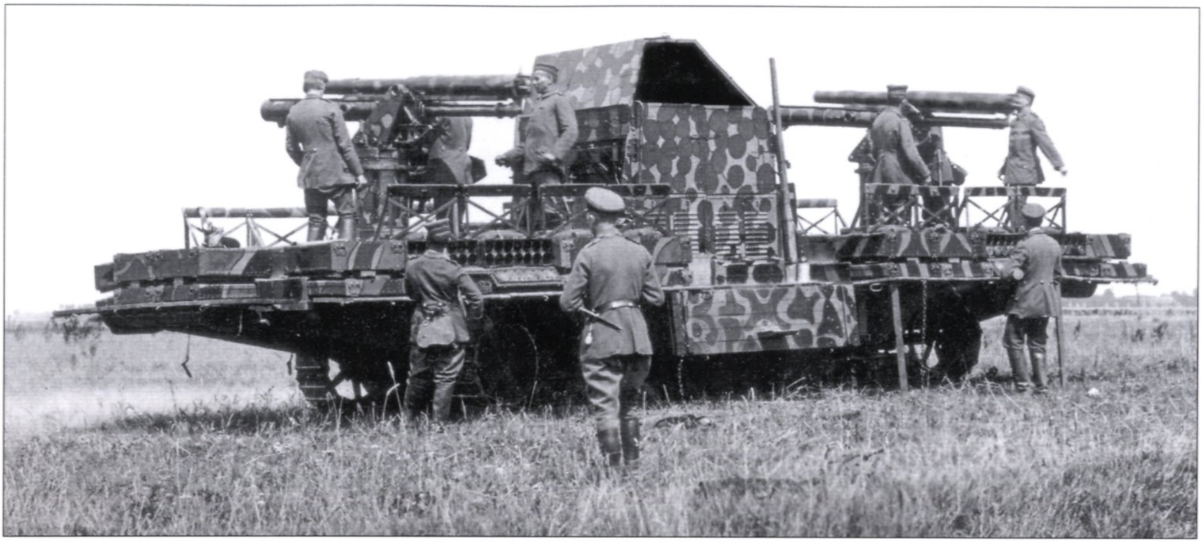


Three chassis were set aside to construct prototypes of the A7V-Flakpanzer, part of a broader effort to develop motorized antiaircraft batteries. The weapons appear to be captured Russian 76.2mm Model 1902 guns, which have had a new trunnion and elevation assembly added for high-elevation fire. (Thomas Anderson)

A7V VARIANTS

The production of the A7V at the Daimler plant was slowed by frequent changes in the design. The armor plate came from two different plants, Röchling and Krupp. On inspection, the Krupp plate was found to be slightly curved. Armor plate was so scarce it could not be scrapped, so instead it was cut into five sections which required changes in the fabrication of these five tanks. Two of the first ten tanks had been ordered from the outset as gun tanks, but the armor plate on eight machine gun tanks had to be modified to accommodate the gun mount.

The initial gun configuration was a *Bocklafette* (trestle-mount) built at the Spandau artillery workshop. An alternative *Sockellafette* (pedestal gun mount) was in development for the A7V-U and this had a number of advantages over the trestle mount. As a result, in September 1917 a decision was made to shift to the pedestal gun mount. In the event, four tanks from the first production batch ended up with the trestle mounting due to time pressure, as not all the gun sights for the pedestal mounts could be delivered in time. The first tank, 501, was the only one completed as a machine gun tank, and was rebuilt with a pedestal gun mount. There was also a continuing series of changes in the actual construction of the tank, with many small detail changes in the design. For example, the first four combat tanks, excluding the anomalous 501 prototype with the Rochling one-piece side armor, had a simple exhaust port on the hull side, while the second batch of five tanks (540–544) with the Krupp multipiece side armor plate had an exhaust pipe to carry the fumes away from the port. To further confuse issues, the vehicle numbers were sometimes out of sequence, as the chassis number sequence was also being used for the



unarmored Gelandwagen prime movers. The second batch of ten tanks introduced a standard armored body adapted to the pedestal gun mount.

A total of 100 A7V chassis were authorized, but after a February 1918 decision to limit A7V tank production, only 20 were completed as tanks. Eventually some 22 production chassis were used since damage to two early chassis (502 and 504) led to their replacement (503 and 544). The remainder of the chassis were used primarily for the A7V-Gelandwagen, also called the Überlandwagen or A7V-Raupenlastwagen. Over 30 of these were completed through September 1918, and they equipped two army transport columns, AKK(R) 1111 and 1122. They typically carried 3 to 4 tons (2.7 to 3.6 tonnes) of supplies, and their drivers distinguished themselves on numerous occasions bringing important supplies to the frontline troops.

Besides the pilot chassis 500 used as a driver trainer, at least ten other A7V chassis were assigned to other variants. The best known was 524, used as the basis for "Hedi," the A7V-U, which was completed in late June 1918 and used for trials. In April 1918, Chefkraft recommended a program to build 240 A7V-Us by 1919, but this did not take place due to its poor performance in trials. After testing, the A7V-U was assigned to the tank driving school of the Garde Kraftfahr battalions in Berlin and later dismantled. Three chassis were assigned to a project to develop an A7V-Flakpanzer for mobile antiaircraft defense. This resembled the Gelandwagen but had two 76.2mm antiaircraft guns on pedestal mounts on either side of the engine platform. Although photographs of these exist, little detail has survived about them. One of the more unusual applications for the A7V chassis was as a trench-digging machine – the A7V-Shützengrabenbagger. At least one was deployed in the field in late 1918. Two chassis were set aside for an A7V-Funkpanzer (radio-tank) based on a March 1918 order from the Signal Troops. Surviving drawings show a conventional A7V tank with multiple aerials and a "clothes-line" antenna circling the roof. The Graben-Funkstation 16 radio transmitter was tested for use on the A7V tank, but it is unclear if any radio-command tanks were ever built. One chassis was set aside for the Artillery Test Commission to examine its use as a heavy artillery tractor.

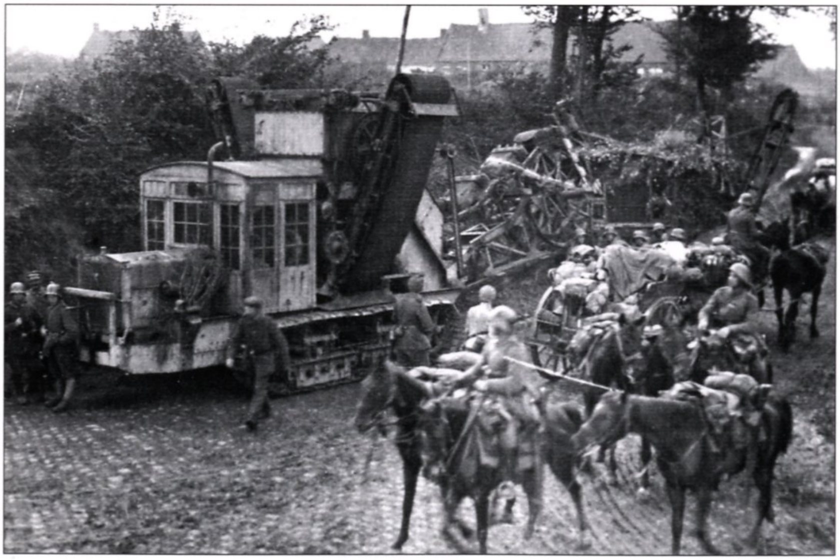
Artillery trials of the A7V-Flakpanzer are seen here in 1918 with both guns in full recoil. The ammunition panniers can be seen in open position behind and under the guns. Unlike French guns, the Russian guns were not re-bored to 77mm due to their brittle metal, and the Germans manufactured 76.2mm ammunition once captured stocks were exhausted. (Thomas Anderson)

CHASSIS	NAME	UNIT	GUN MOUNT	ARMOR PLATE	FATE
500	–	Driver School	none	wooden	Prototype used later for training
501	Gretchen	Abteilung 1, Abteilung 2, Abteilung 3	MG, later pedestal	early Röchling	In Wiesbaden at end of the war
502/503	–	Abteilung 1, Abteilung 3	trestle; later pedestal	early Röchling	Unserviceable in Charleroi October 1918, scrapped by French after war
504/544	Schnuck	Abteilung 2	pedestal	early Krupp	Knocked out by German artillery near Fremicourt, August 30, 1918; displayed in Britain and later scrapped
505	Baden I	Abteilung 1, Abteilung 3	trestle, later pedestal	early Röchling	In Wiesbaden at end of the war
506	Mephisto	Abteilung 1, Abteilung 3	trestle	early Röchling	Abandoned at Villers-Bretonneux, April 28, 1918, later recovered by Australians; only surviving A7V
507	Cyclop	Abteilung 1, Abteilung 3	trestle, later pedestal	early Röchling	In Wiesbaden at end of the war
524	Hedi	test	pedestal	A7V-U	Broken up for parts after trials in late 1918
525	Siegfried	Abteilung 2	pedestal	standard	In Wiesbaden at end of the war
526	–	Abteilung 1	pedestal	standard	Damaged near Reims in June 1918 and cannibalized
527	Lotti	Abteilung 1	pedestal	standard	Damaged and abandoned near Reims, June 1, 1918
528	Hagen	Abteilung 2	pedestal	standard	Knocked out by German artillery near Fremicourt, August 30, 1918; displayed in Britain and later scrapped
529	Nixe II	Abteilung 2	pedestal	standard	Knocked out by French artillery near Reims, May 31, 1918; taken to APG in the USA after the war, scrapped 1942
540	Heiland	Abteilung 3, Abteilung 1	pedestal	early Krupp	In Wiesbaden at end of the war
541	–	Abteilung 1	pedestal	early Krupp	In Wiesbaden at end of the war
542	Elfriede	Abteilung 2	pedestal	early Krupp	Abandoned at Villers-Bretonneux, April 28 1918; recovered by the French and later scrapped
543	Hagen, Adalbert, Konig Wilhelm	Abteilung 2, Abteilung 3	pedestal	early Krupp	In Wiesbaden at end of the war
560	Alter Fritz	Abteilung 1	pedestal	standard	Knocked out by artillery near Cambrai, October 11, 1918
561	Nixe	Abteilung 2	pedestal	standard	Damaged and cannibalized for parts in June 1918
562	Herkules	Abteilung 1, Abteilung 2	pedestal	standard	Broke down and abandoned near Cambrai, October 3 1918
563	Wotan	Abteilung 2	pedestal	standard	On the way to Wiesbaden at end of war
564	–	Abteilung 3	pedestal	standard	In Wiesbaden at end of the war

PANZERS IN TRAINING

The first German Panzer unit into the field was Abteilung 1, which left the Daimler plant in Berlin for a training course at Sedan on January 5, 1918. After basic training, a final demonstration was held for Crown Prince Wilhelm, who recommended that the unit receive further training with Sturmbataillon 5 (Assault Battalion 5). This assault infantry unit was formed from combat veterans to train other infantry units in the latest tactics. The problems uncovered during the Sedan training led the OHL once again to slow the pace of A7V production. Although there had been plans to construct another 30 armored hulls, these were postponed on January 18, 1918, and instead only 20 of the 38 hulls already ordered were to be fitted to chassis, and the remaining 18 held in reserve until the A7V tank proved itself in combat.

The Sedan training proved useful for the new tank crews, but when they conducted a demonstration for Gen Ludendorff on February 25, 1918, he remarked "the impression was not a good one." Reports submitted to the OHL in mid-February made it clear that the A7V was poorly suited for current battlefield conditions, and that in the time since its original conception in 1916, the width of trenches had generally increased from about 1.6m to 4m, which the A7V could not surmount. The mobility of the A7V was superior to the French Schneider and St Chamond, but distinctly inferior to the British tanks. Maj Rohr, the commander of Sturmbataillon 5, suggested that the A7V could only be used in battle if the terrain was not overly disturbed by artillery craters. The Chefkraft recommended that only 20 A7Vs be completed in tank configuration. The remaining 80 chassis would be used primarily as Gelandwagen transports, though a few would remain in the test role. This was approved by the OHL on March 3, 1918, essentially ending German tank production in World War I. While the OHL had ordered on February 27 that a new high-priority tank program be started to field tanks patterned after the British types, this would not materialize before the war ended.



At least a single example of the A7V-Schützengrabenbagger trench-digger was completed, and it is seen here moving to the front on October 28, 1918. (NARA)

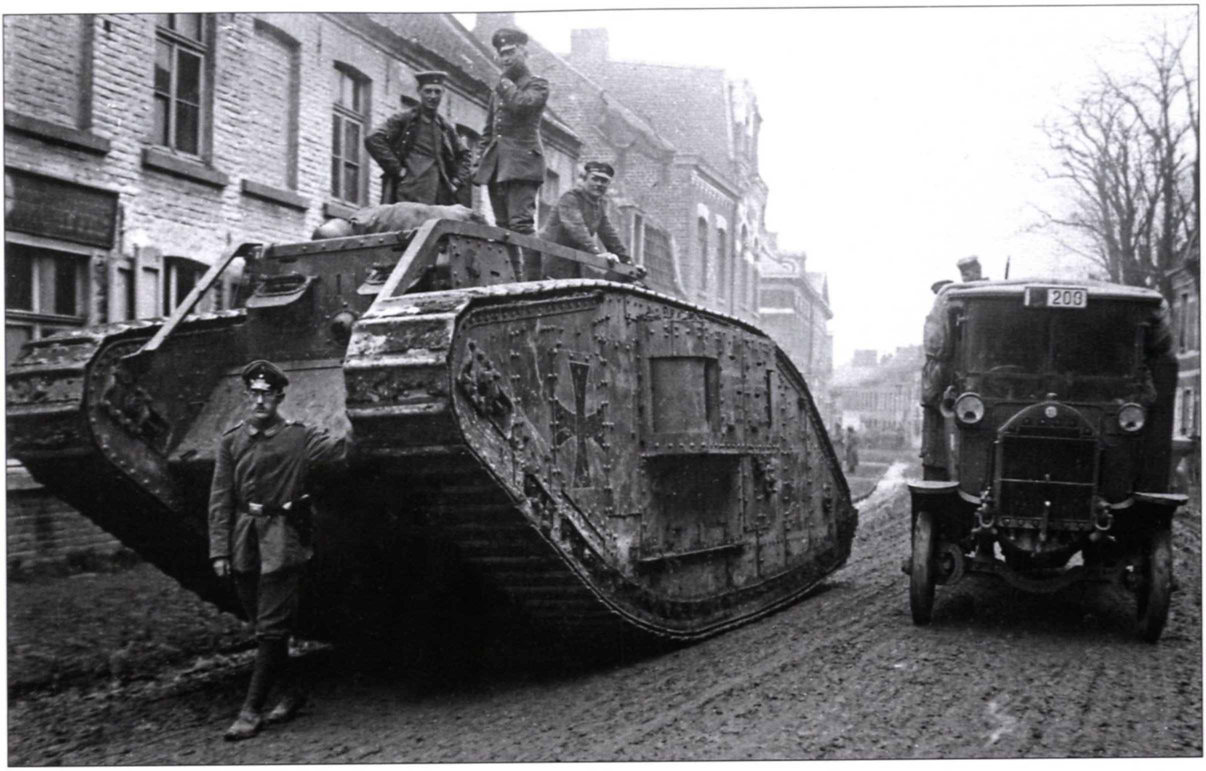
One of the British Mark IV Male tanks captured at Cambrai, F41 "Fray Bentos," was sent to Germany and demonstrated to Kaiser Wilhelm II and the OHL at Bad Kreuznach on December 19, 1917. Here, the Kaiser is seen inspecting Capt Borchert and his crew, with the tank draped with a camouflage net in the background. Borchert was the commander of the 2nd Army transport units which had salvaged the tanks around Cambrai. (NARA)

The shortfall in tanks was made up primarily with captured British tanks. The first serviceable tank to fall into German hands was a Mark IV Female that was collected under fire by a special recovery team in no man's land near Fontaine-Notre-Dame. When the 2nd Army counterattack overwhelmed the British salient near Cambrai, its motor element Armee Kraftwagen Park 2 (Army Motor Vehicle Park 2; AKP 2) was assigned to create the special Tankbergungsstelle Cambrai (Tank Recovery Command – Cambrai) to retrieve as many tanks and tank parts as possible. Chefkraft decided to center its tank rebuilding efforts in nearby Charleroi due its excellent rail connections, and the task of rebuilding the tanks was assigned to Bayerischer Armee Kraftwagen Park 20 (BAKP 20; Bavarian Army Motor Vehicle Park 20). Over 50 tanks were recovered from the Cambrai battlefield, but many were damaged beyond repair. Of these, 28 were transferred to BAKP 20 at the Germaine plant in Charleroi by the end of March, with about ten being restored to working condition.

These ten tanks were used to form two more tank units, Abteilungen 11 and 12, each equipped with two Mark IV Male gun tanks and three Female machine gun tanks. The guns in the British tanks were unserviceable, but it was found that the Maxim-Nordfeldt 57mm QF gun could be adapted to fit. It was not easy to adapt the standard German MG08 to the British tanks, so the Lewis machine guns were retained, but were adapted to fire German ammunition. By the third week of March 1918, both Abteilungen 11 and 12 were trained but the 57mm guns were not yet ready.

INTO COMBAT

The OHL hoped to use tanks during its massive new offensive, Operation *Michael*. Only two units were ready, Abteilung 1 with A7V tanks and Abteilung 11 with five captured Mark IV Females, hardly an impressive


A captured Mark IV Female of Abteilung 11 in Armentières in April 1918 shortly after the unit's combat debut near St Quentin. At this point, the tank was probably still in British colors and its insignia is limited to a set of Maltese crosses on the hull side. (NARA)

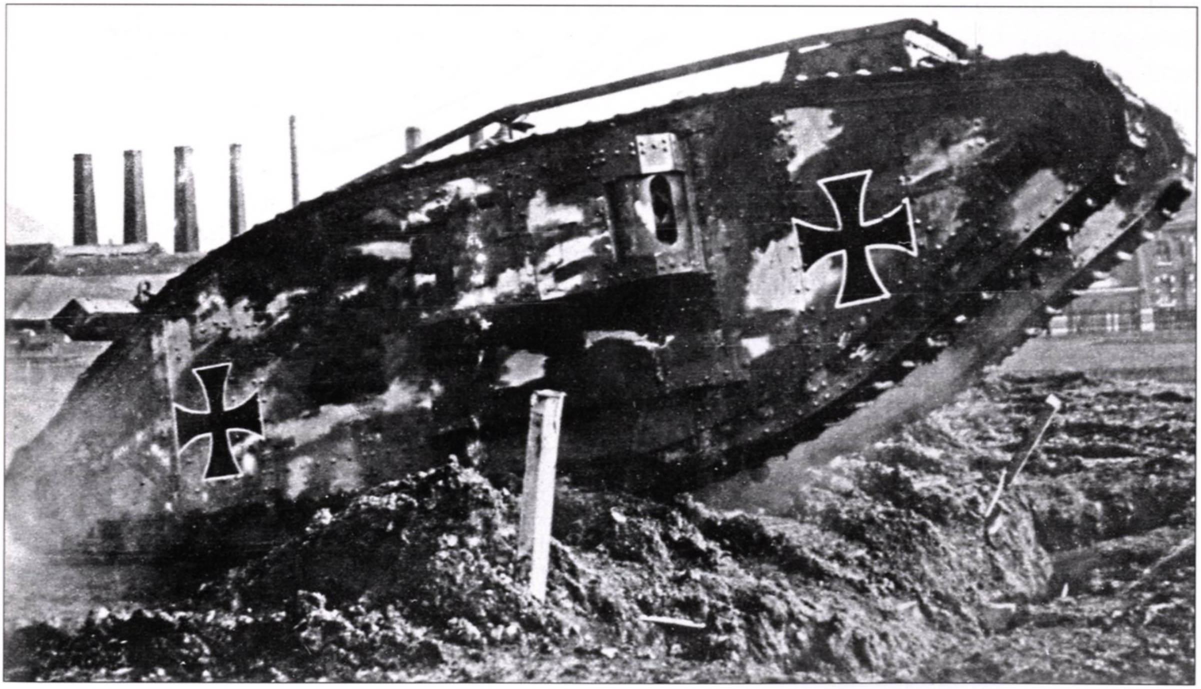
armored strike force. The tanks operated in conjunction with elite assault troops from Sturmbataillon 5 as the spearhead for the 36th Infantry Division in the St Quentin area.

Under heavy fog and after a substantial barrage, the tank attacks began at 0930hrs on March 21, 1918. Abteilung 1 started with four tanks as one tank had broken down the day before. In such poor visibility, two tanks became trapped in barbed wire and the unit commander ordered a temporary halt until 1130hrs, when the weather conditions improved. After being subjected to a British artillery bombardment with gas shells, three serviceable tanks set out to assist the German infantry. Another tank broke down with transmission problems, but the sudden appearance of two tanks demoralized the British infantry and overcame the British positions. The remaining two A7V tanks continued to support the infantry for the rest of the day, but the attack highlighted the fragility of the new tanks. The captured tanks of Abteilung 11 set off around 0940hrs, enveloped in fog. The tanks were so slow that they became separated from the advancing infantry, and when the fog finally lifted later in the morning, British artillery damaged two tanks. In general, Abteilung 11 was less successful than Abteilung 1, and neither unit was able to play the spearhead role envisioned for them.

Operating the A7V tank in combat conditions proved to be a challenge. Although the crew was normally 18 men, sometimes up to two-dozen were carried. The extra men were necessary as the tank crew would sometimes have to disembark to fill trenches in or move other obstructions in order to proceed to their objective, and the extras also served as runners to communicate with neighboring infantry or other tanks. The A7V interior was dominated by the engine compartment, with its massive radiators emitting heat directly into the fighting compartment. In the spring and summer months, the interior temperatures rose to a dangerous 140 degrees Fahrenheit (60 degrees centigrade), a situation worsened by the need to employ gas-masks, and the dangerous build-up of fumes from the tank's own weapons. The appalling conditions inside the tank required the commander periodically to halt the tank and allow the crew to rest and cool off. The A7V's mechanical design was rudimentary and mechanical breakdowns were a constant problem. Its durability was so poor that after a day's combat operation the tanks usually had to be returned to the Charleroi depot for rebuilding.

As Operation *Michael* petered out, the tanks were assigned to follow-on operations. Plans to use the A7V were frustrated by rough terrain and a mission by the captured tanks of Abteilungen 11 and 12 on April 9, 1918, turned into a fiasco when nearly all the tanks broke down or became bogged in the soft soil near the Lys River. Towards the end of April, all three A7V units were ready and they were assigned to a major attack towards the Somme. Mechanical breakdowns led to an improvised organization for the attack, consisting of Gruppe Skopnik with three A7Vs of Abteilung 1 supporting the 228th Infantry Division, Gruppe Uihlein, with the other two tanks of Abteilung 1 and four A7Vs of Abteilung 3 to support the 4th Guards Infantry Division, and Gruppe Steinhardt, with four A7Vs of Abteilung 2 in support of the 77th Reserve Division. This would prove to be the largest German tank attack of the war – a paltry 13 tanks.

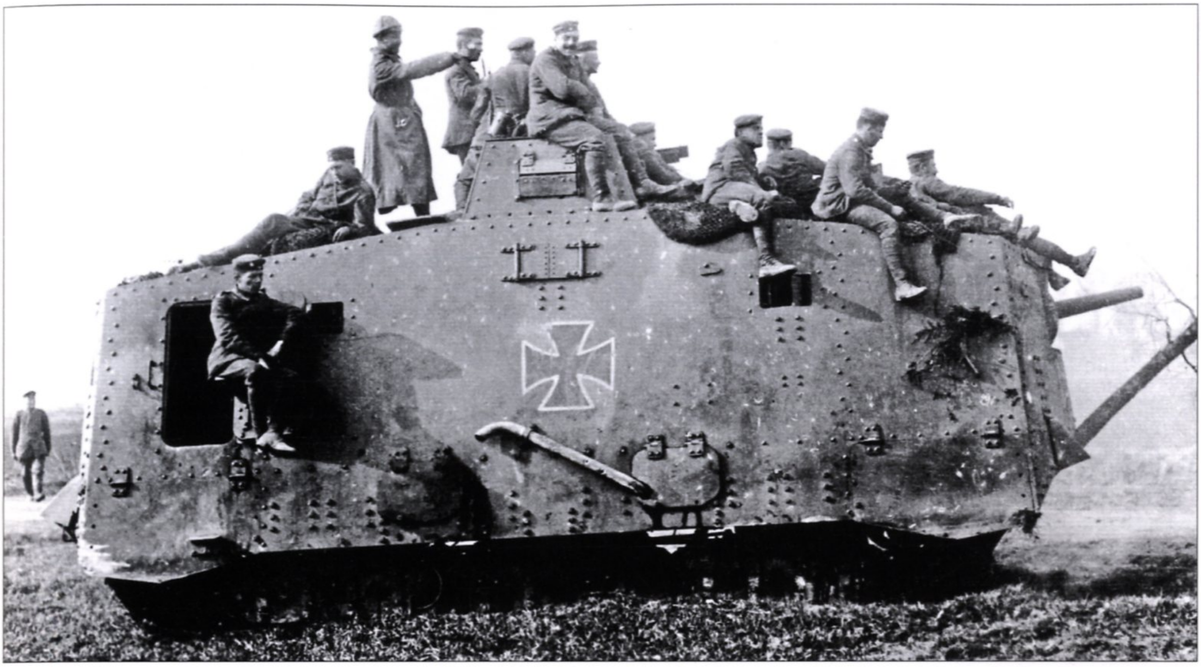
The attack in the early morning hours of April 24, 1918, centered around the town of Villers-Bretonneux. Gruppe Skopnik emerged out of the fog around 0700hrs, fought its way through the town against startled British defenders, and played an important role in its capture. Gruppe Uihlein was similarly successful in its initial advance, shocking



A captured Mark IV Female tank is put through its paces in training near Essen during the spring of 1918. (NARA)

An A7V Gelandwagen of AKK(R) 111 is seen bringing forward ammunition in northern France on April 5, 1918. (NARA)

the British infantry when the tanks suddenly emerged from the fog. But once the fog lifted, one A7V tank was hit by British field guns and its gun disabled. Around noon, the group assisted in repulsing an attack by the 1st Sherwood Foresters who were trying to retake the western part of the town. The southernmost unit, Gruppe Steinhardt, set out for the hamlet of Cachy, but Panzer 561 "Nixe" commanded by Lt Wilhelm Blitz was delayed by mechanical problems. After sorting out the problems, Nixe headed forward, and came in sight of the village around 1100hrs as the fog was clearing. The interior din of the A7V was so loud that Blitz and his crew didn't realize that they were under fire from three British tanks of the 1st Battalion, Tank Corps – a Mark IV Male and two Females. The Nixe crew finally spotted the Mark IV Male commanded by 2nd Lt F. Mitchell and began to engage it with their own 57mm gun. Almost as soon as they did so, the British tank halted and the Nixe crew assumed they had disabled it. In fact, Mitchell halted his tank to give his gunner a better shot. Nixe's gun was turned on the two other Mark IVs, which were disabled by 57mm gun fire as they attempted to retreat towards Cachy. In turn, Nixe suffered a hit from the Mark IV on the bow near the gun, killing the gunner, seriously wounding two of the crew, and injuring three others. Fearing that the hit would detonate ammunition stored nearby, Blitz ordered the remaining crew to abandon Nixe. Mitchell's Mark IV hit Nixe twice more on the side. After the Mark IV withdrew, Blitz and his crew remounted Nixe when it was clear it would not blow up, and managed to drive it back 1.2 miles (2km) when it broke down due to an oil leak caused by one of the flank hits. While hardly the most important event in a day of heavy fighting, the encounter near Villers-Bretonneux would go down in military history as the first tank-vs-tank encounter. The skirmish was a stalemate, with Nixe accounting for two British tanks, but was itself damaged enough to be forced to retreat.

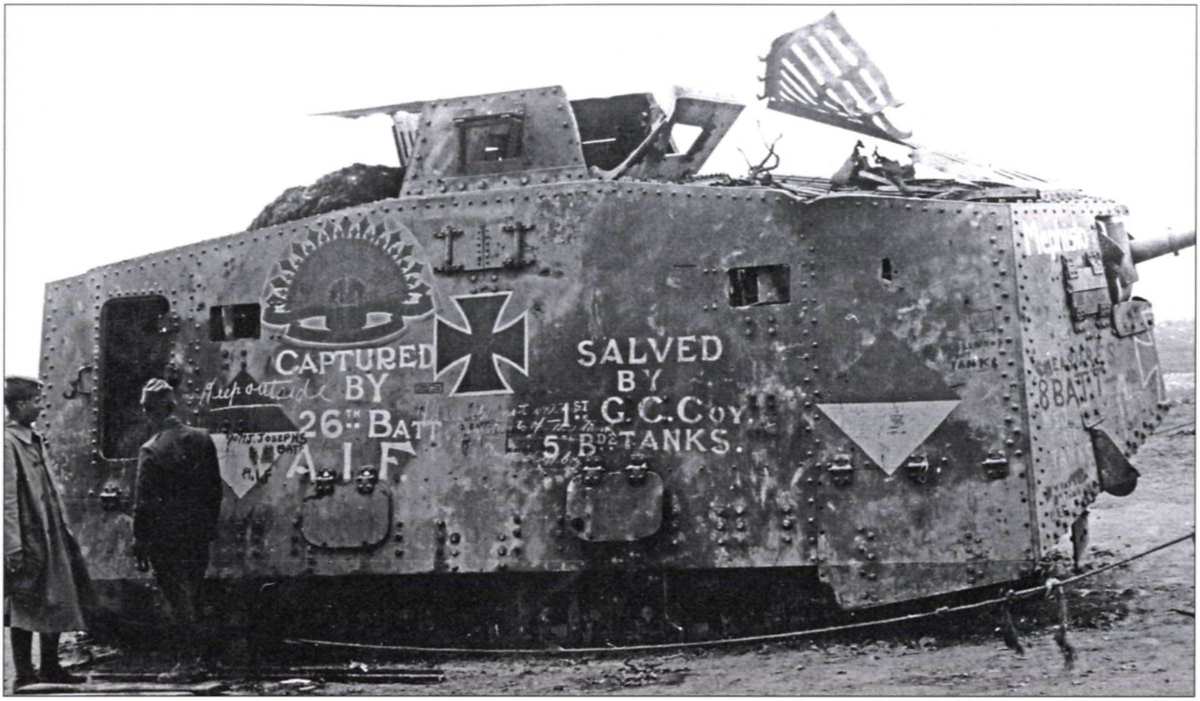


Panzer 525 "Siegfried" is seen in the summer of 1918 after the Villers-Brettoneux fighting. Close examination of the photo shows evidence of numerous machine-gun strikes on the side armor. The interior of the tank was extremely hot and noisy, so the crew rode outside when possible. (NARA)

Later in the day another tank-vs-tank skirmish occurred when seven Whippet tanks of 10th Company, 3rd Battalion, Tank Corps, supported by Mitchell's Mark IV, attacked the 77th Reserve Division. After overrunning forward German defenses, the Whippets were attacked from two sides by a battery of 77mm field guns and A7V 525 "Siegfried." The German fire knocked out four Whippets, and disabled the Mark IV.

By the end of the day, the attack on Villers-Bretonneux could be counted as the first success of the German Panzer force. Two A7V tanks lay abandoned, 506 "Mephisto" when it ran into a shell-hole, and 542 "Elfriede," which had turned over in a sand pit. The attack was hardly noticed by Ludendorff and the OHL, as that night most of the salient was retaken by an Australian counterattack. Attempts were later made to

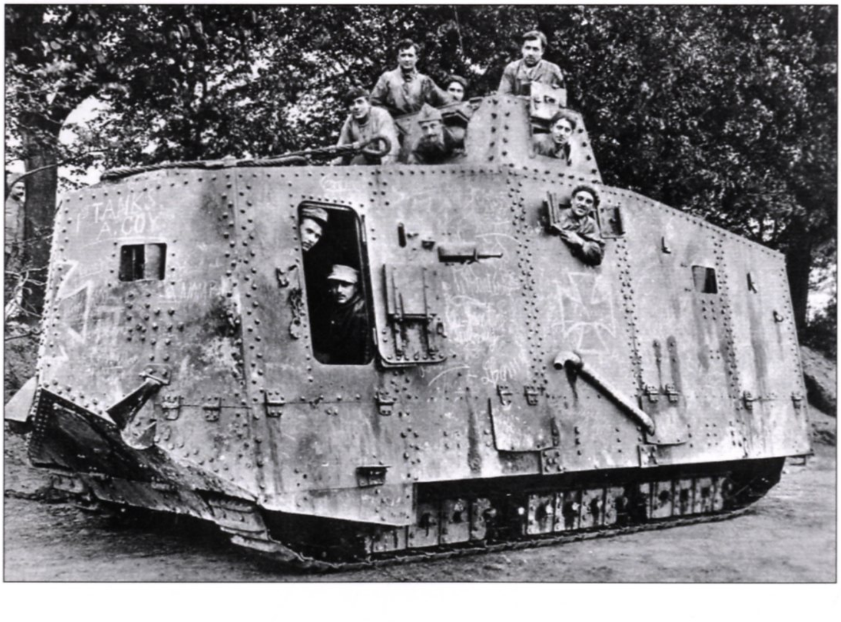
Although often described as a photo of the A7V tank attack at Villers-Brettoneux, this photo is one from a sequence taken of Abteilung 2 during training near Reims in June 1918. The tanks seen here are probably "Schnuck" to the left and "Hagen" to the right. (NARA)


CAPTURED BY 26th BATT A.I.F.
SALVED BY 1st G.C.Coy 5th Bde TANKS.

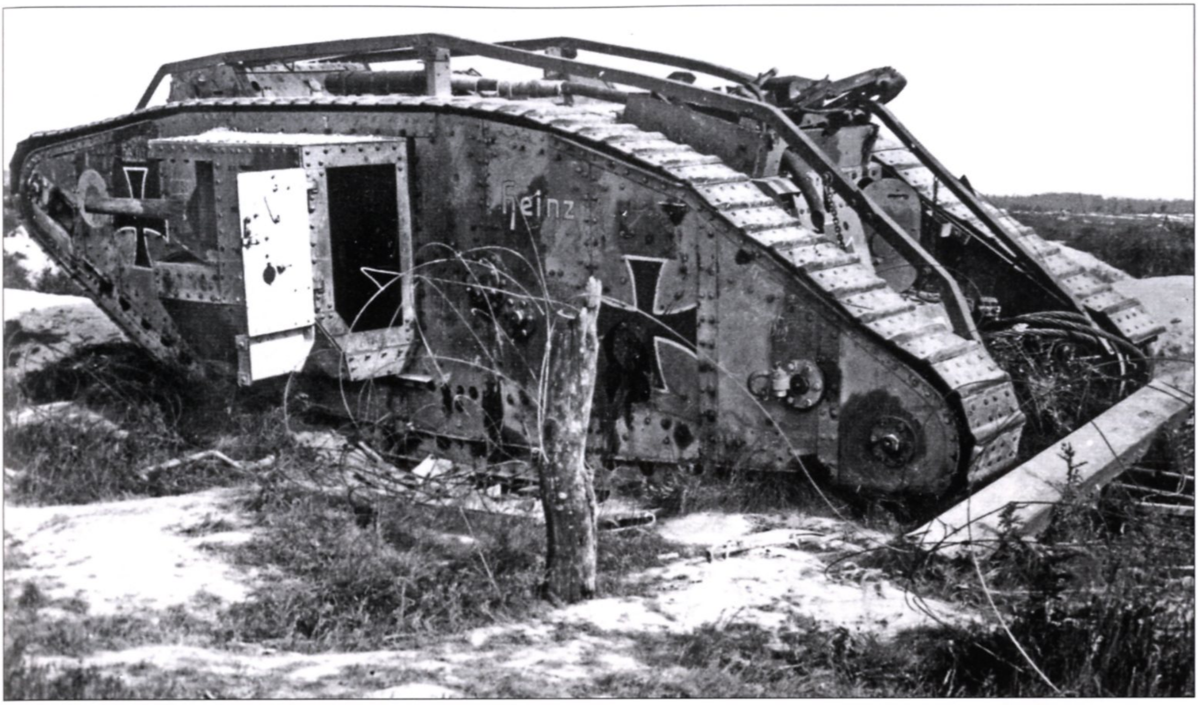
Panzer 506 "Mephisto" is seen here in September 1918 near Poulainville after having been recovered by the Australians. The heavy damage to the roof was caused by a German patrol sent out to demolish another abandoned A7V, "Elfriede." Mephisto is the only surviving A7V, preserved at the Queensland Museum. (NARA)

demolish the abandoned Elfriede, but instead the German patrol blew up Mephisto, which was 2,300ft (700m) away. Elfriede was dragged away by the French on May 15, 1918, the first A7V to fall into Allied hands, while Mephisto rested in no man's land until July 14, when it was recovered by the Australians. It was shipped back to Australia after the war and is the only surviving example of the A7V still in existence.

The captured-tank units were used to support Operation *Blücher* against the French 6th Army towards the Marne, but were not successful; once again the Mark IVs proved to be too slow during a fast infantry advance.



A rear view of Abteilung 2's Panzer 542 "Elfriede,"which was abandoned in April 1918 during the fighting for Villers-Bretonneux. It is seen here after it was recovered by French troops. (NARA)

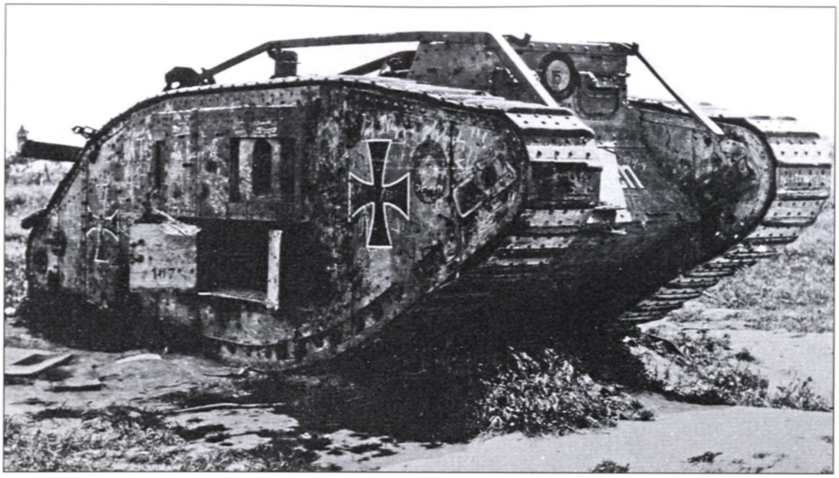


"Heinz," Panzer 207, the No.4 tank of Abteilung 14, was lost in action during the fighting near Fort de la Pompelle on June 1, 1918. (Patton Museum)

Another attack was planned towards Reims involving all seven tank units, but the poor mechanical state of many of the tanks forced a temporary consolidation of the units. After some preliminary engagements in which an A7V was lost, the main attacks began on June 1 with mixed results. Abteilung 1 supported the 238th Infantry Division in its attack towards Fort de la Pompelle, but two tanks broke down before the attack began. On reaching the French trench line, two of the three remaining tanks became stuck and the attack was called off. The attack by Abteilung 13 got off to a bad start when two tanks broke down before reaching the start line and a third tank limped back to German lines with mechanical problems after a short foray. Two other Mark IV tanks provided useful service in the fighting around Fort de la Pompelle, but both were lost in the process.

The German 18th Army planned an offensive against the French salient along the Matz River on July 9, and all available tank units were allotted to the operation, amounting to a pitiful seven tanks, two of which broke down in the preparatory phase. When the attack commenced on July 9, Abteilung 3, with its five A7V tanks, was all the Panzer support available and so they were split between two infantry divisions. They accomplished little and by the end of the day were inoperative and badly in need of repair.

With a steady flow of newly captured tanks becoming available from Charleroi, the captured-tank units were refurbished with new tanks in preparation for a 3rd Army attack near Souain on July 15. The captured Mark IV tanks made a good showing in the initial phase, in most cases reaching and overcoming the first French defensive line. But the French were now following the German practice of keeping the first trench line manned at very low strength, which accounted for the easy German advance. Once beyond the first trench line, the German tanks began to encounter the core of the French defenses, with several breaking down

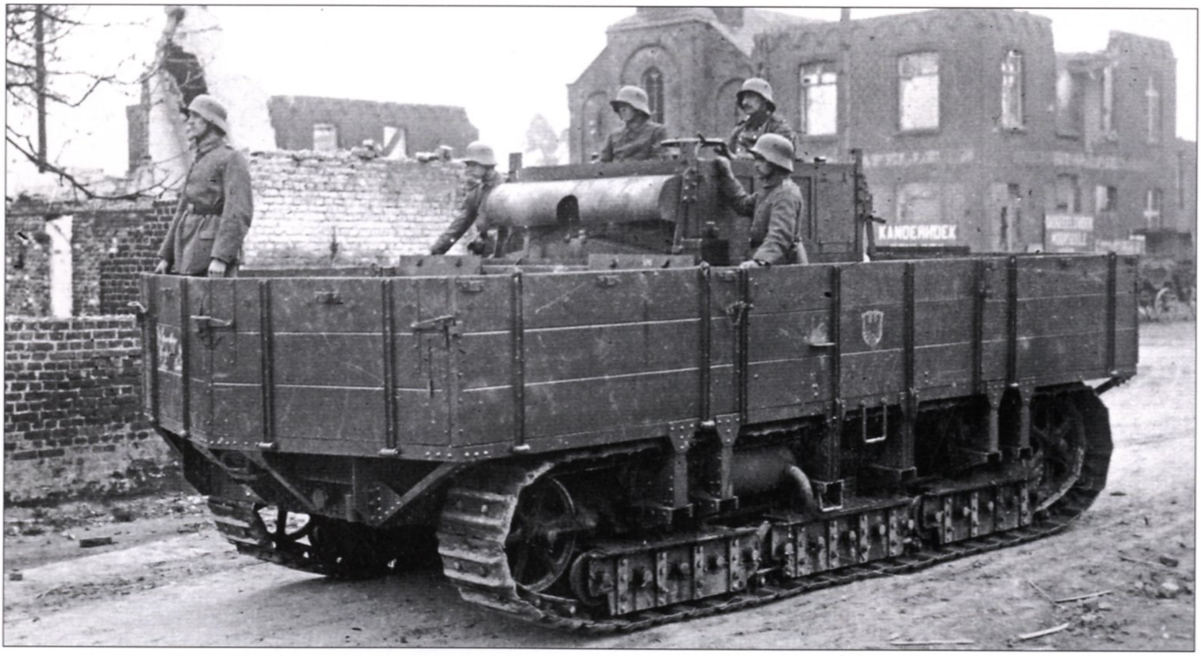


During the fighting near Fort de la Pompelle on June 1, 1918, Lt Burkhart and the crew of Panzer 107 "Ännchen" of Abteilung 12 dismounted from their captured Mark IV Female to assist the infantry in repulsing a French infantry attack. The crew later retreated with the German infantry, leaving Ännchen behind. (NARA)

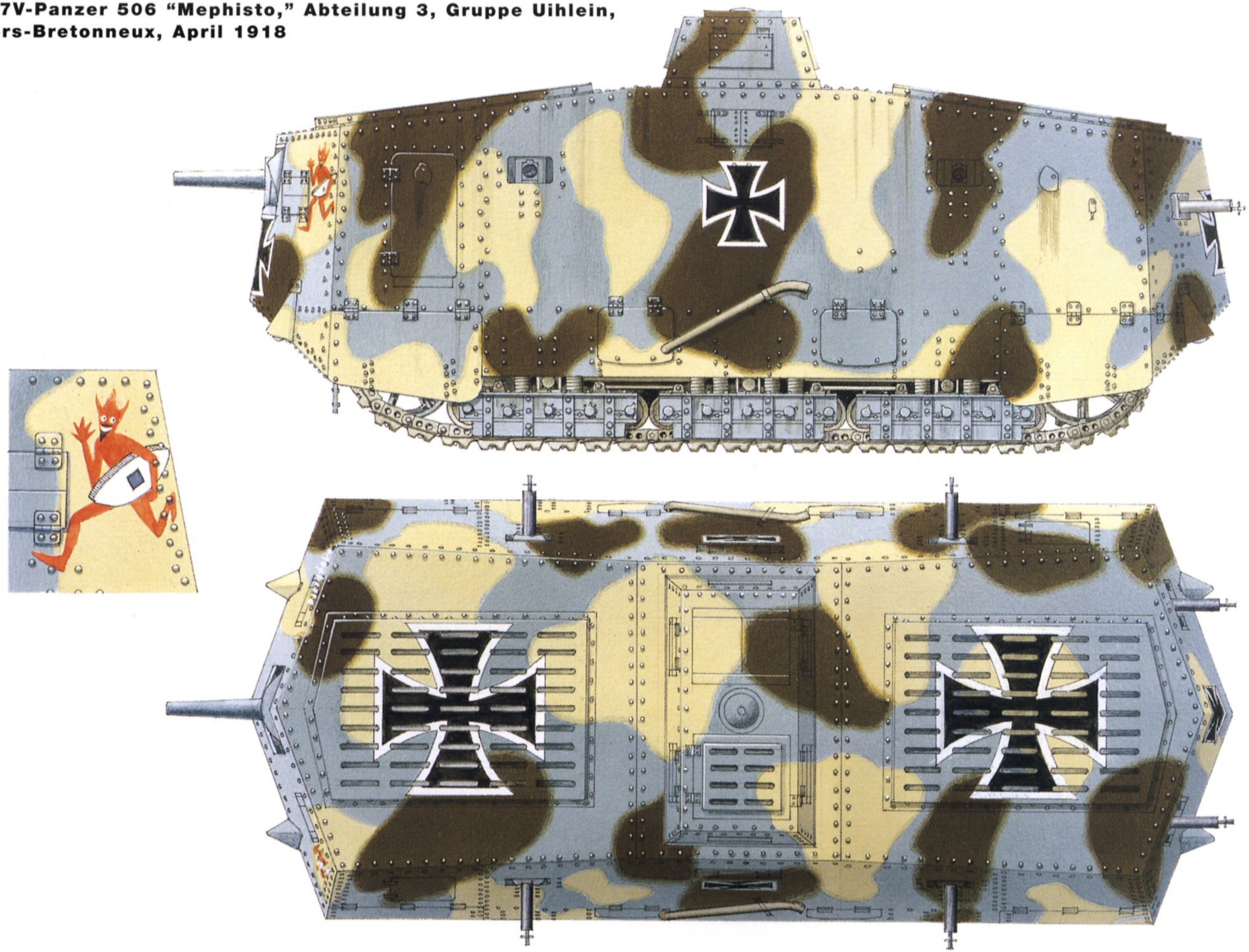
or becoming trapped in trenches, and eight being knocked out by field guns. The Souain attack decimated the captured-tank units and the sacrifice of the tanks accomplished little.

After repairs, the A7V units were committed to the 7th Army's Operation *Marneschutz* attack in mid-July. All three units could barely muster enough tanks for two units. The A7V tanks from Abteilungen 1 and 2 assisted the infantry in clearing out numerous French machine gun positions and trench lines, but in reality the great German summer offensive was out of steam. On June 18, the French struck the bulge created by the past few weeks of fighting. They swarmed over the German defenses with 478 tanks in the largest tank attack of the war to date, and their first massed use of the new Renault FT tanks. The German salient was erased and for the rest of the war, the German Army would be on the defensive.

An A7V Gelandwagen moves through Ypres during 1918. In this view, the protective roof has been removed from over the driving compartment. (NARA)



A: A7V-Panzer 506 "Mephisto," Abteilung 3, Gruppe Uihlein, Villers-Bretonneux, April 1918



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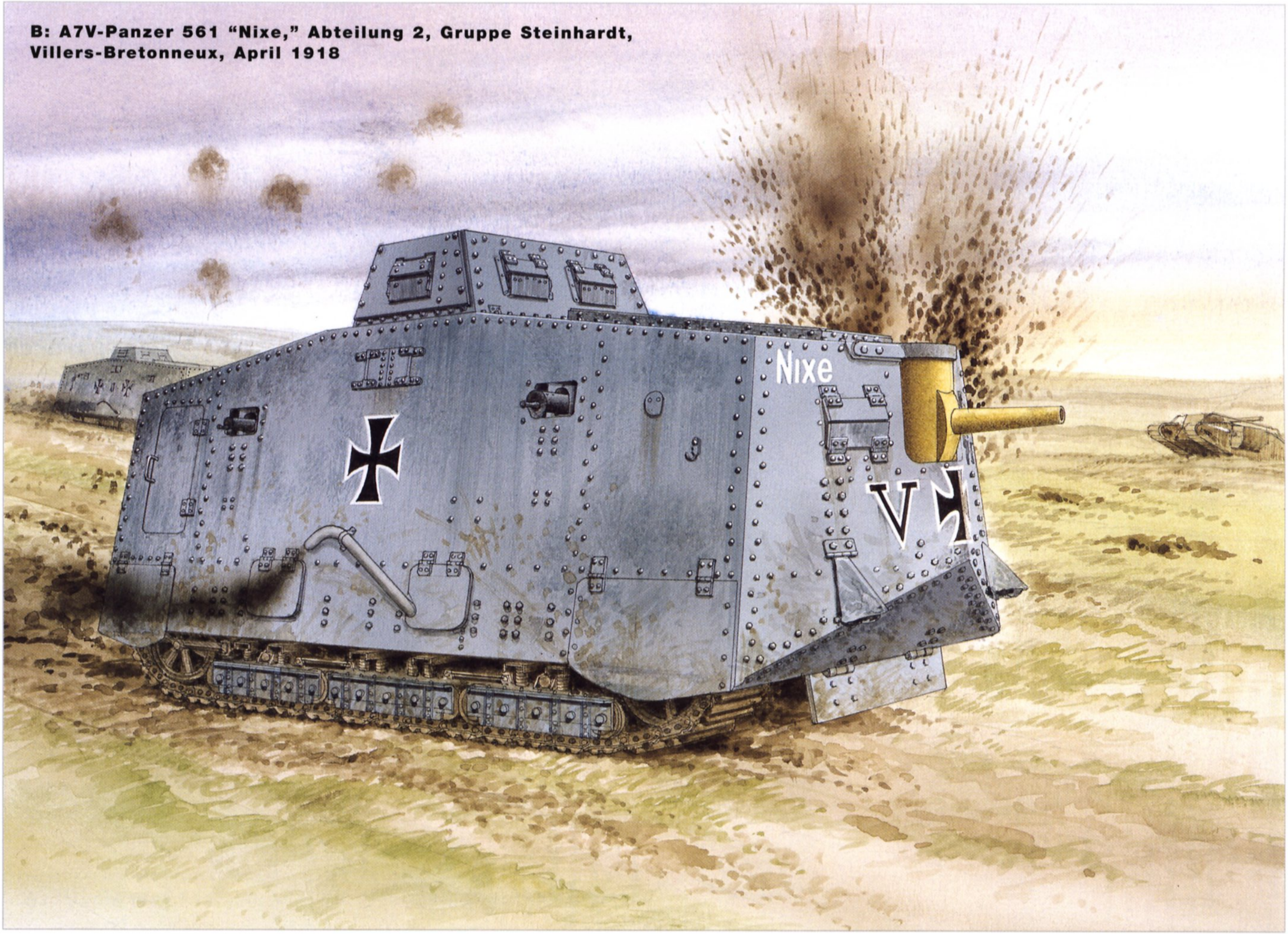
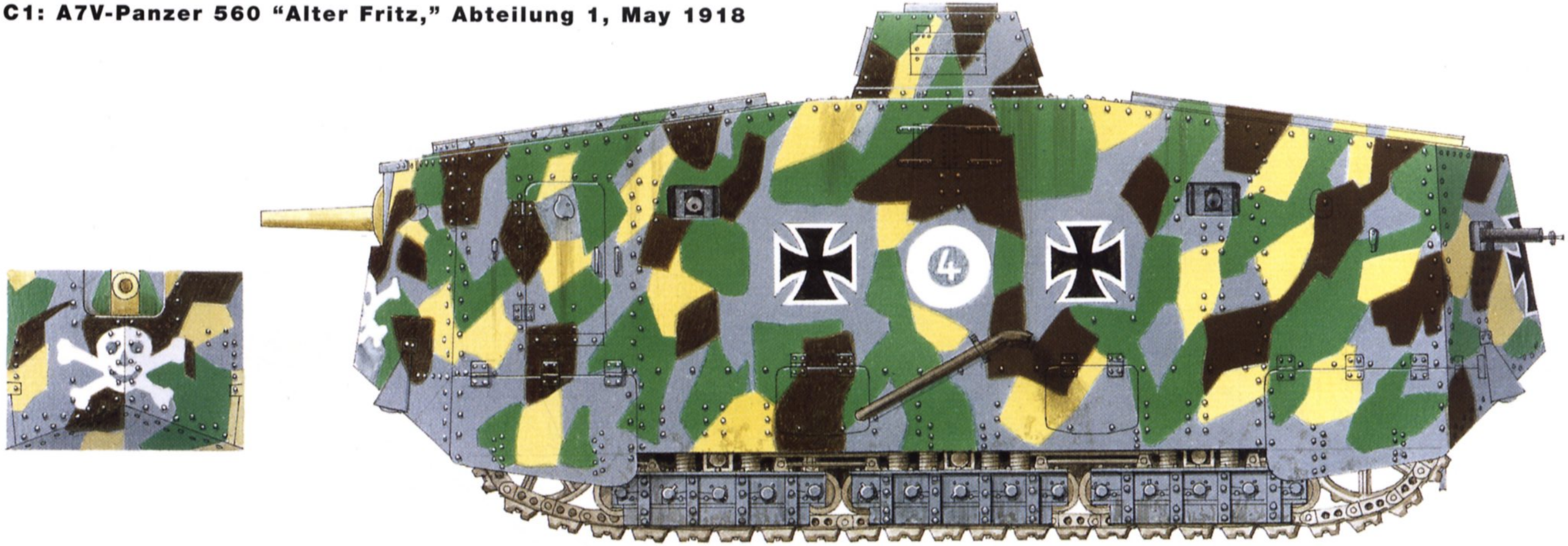
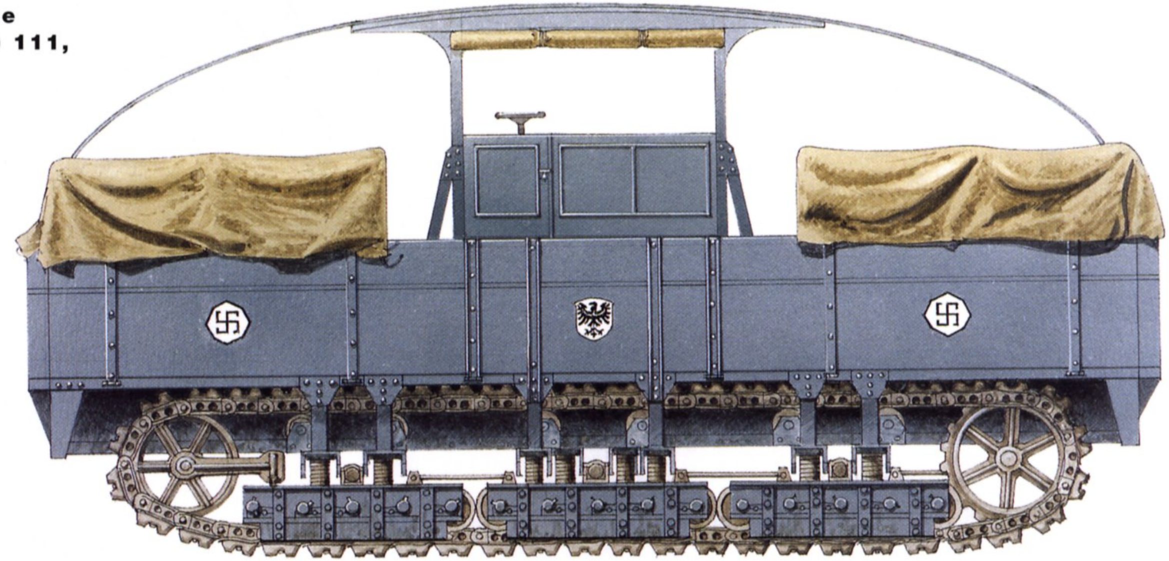


B: A7V-Panzer 561 "Nixe," Abteilung 2, Gruppe Steinhardt, Villers-Bretonneux, April 1918

C1: A7V-Panzer 560 "Alter Fritz," Abteilung 1, May 1918



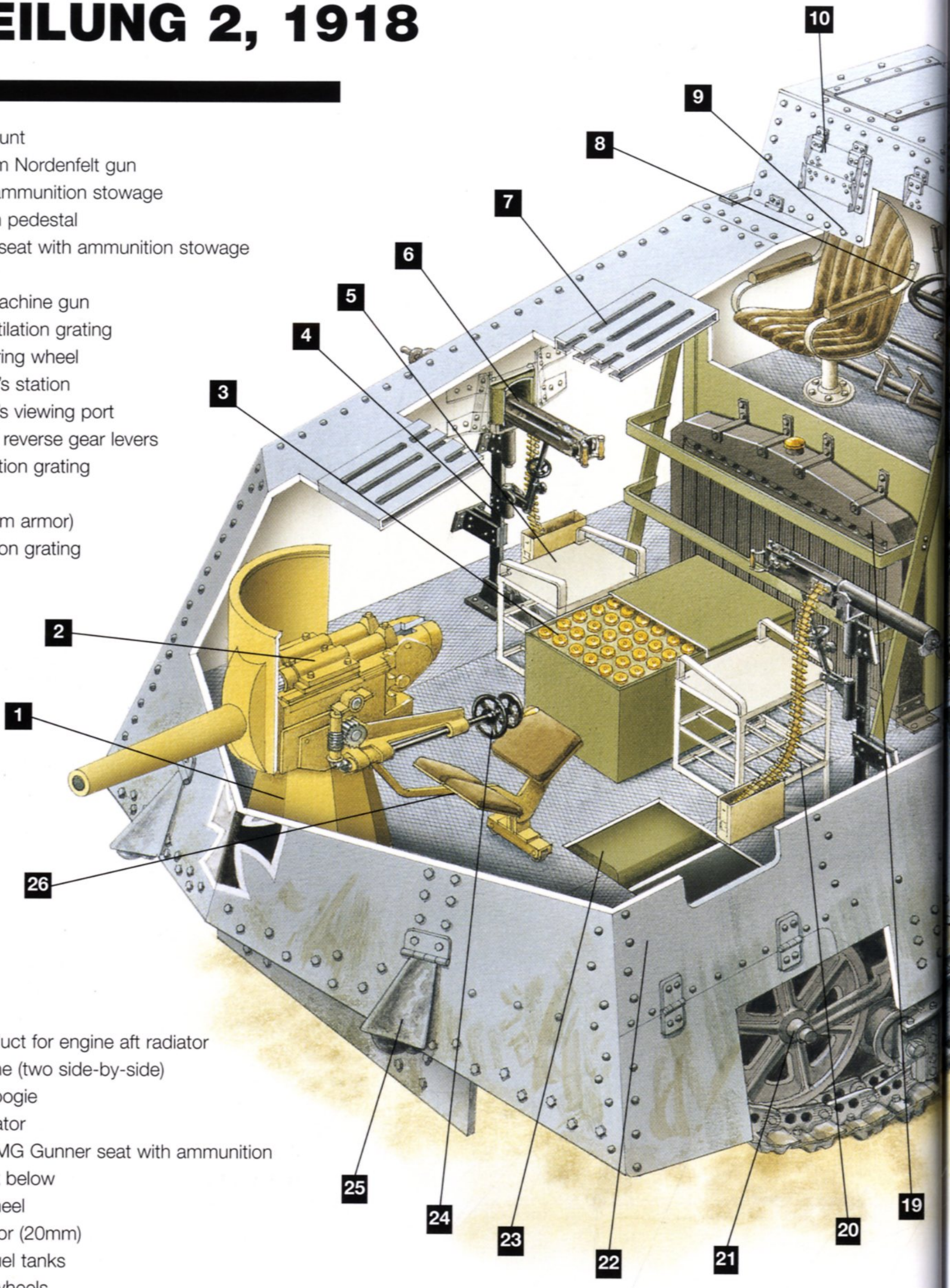
C2: A7V-Gelandwagen, Armee Kraftwagen Kolonne (Raupe) 111, northern France, 1918



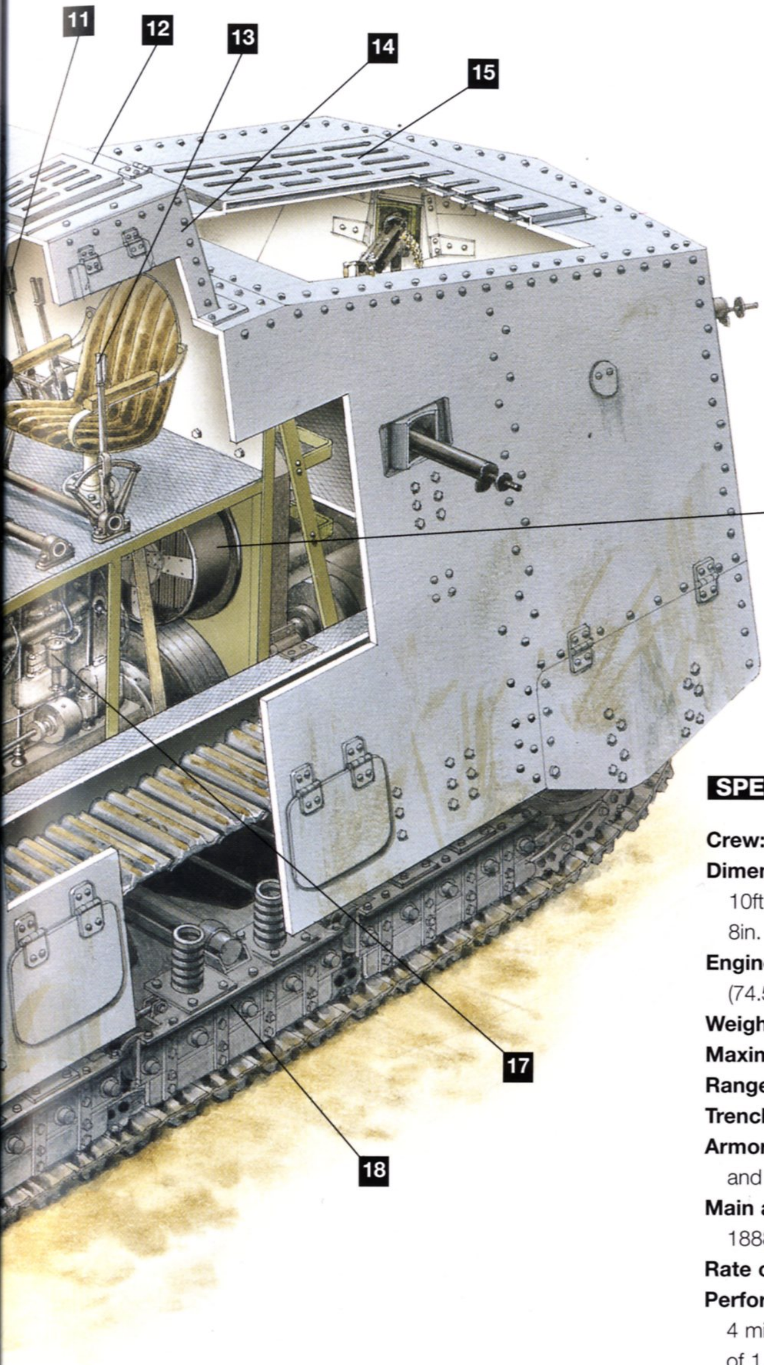
D: A7V-PANZER 563 "WOTAN," ABTEILUNG 2, 1918

KEY

1 Pedestal mount
2 57mm Maxim Nordenfelt gun
3 57mm gun ammunition stowage
4 Machine gun pedestal
5 MG Gunner seat with ammunition stowage racks below
6 Right side machine gun
7 Forward ventilation grating
8 Driver's steering wheel
9 Commander's station
10 Commander's viewing port
11 Forward and reverse gear levers
12 Driver ventilation grating
13 Brake lever
14 Cupola (15mm armor)
15 Rear ventilation grating



16 Cooling fan duct for engine aft radiator
17 Daimler engine (two side-by-side)
18 Suspension bogie
19 Forward radiator
20 Left forward MG Gunner seat with ammunition stowage rack below
21 Front idler wheel
22 Hull side armor (20mm)
23 Under-floor fuel tanks
24 Gun control wheels
25 Cover over towing hook
26 Gunner's seat



SPECIFICATIONS

Crew: 18 men+

Dimensions: 24ft 1in. (7.35m) long, 10ft (3.06m) wide, 10ft 11in. (3.35m) high, 8in. (0.2m) ground clearance

Engine/transmission: Two Daimler 165-204 100hp (74.5kW) four-cylinder engines, each with sliding gear

Weight: 33 tons (30 tonnes)

Maximum speed: 10mph (16km/h)

Range: 22 miles (35km) terrain; 43 miles (70 km) road

Trench crossing ability: 6ft 6in. (2m)

Armor: 1.18in. (30mm) bow; 0.59in. (15mm) sides and rear; 0.23in. (6mm) roof

Main armament: 57mm Maxim-Nordfeldt Model 1888 Quick Firing gun, L/26.3 caliber

Rate of fire: 20–25 rounds per minute

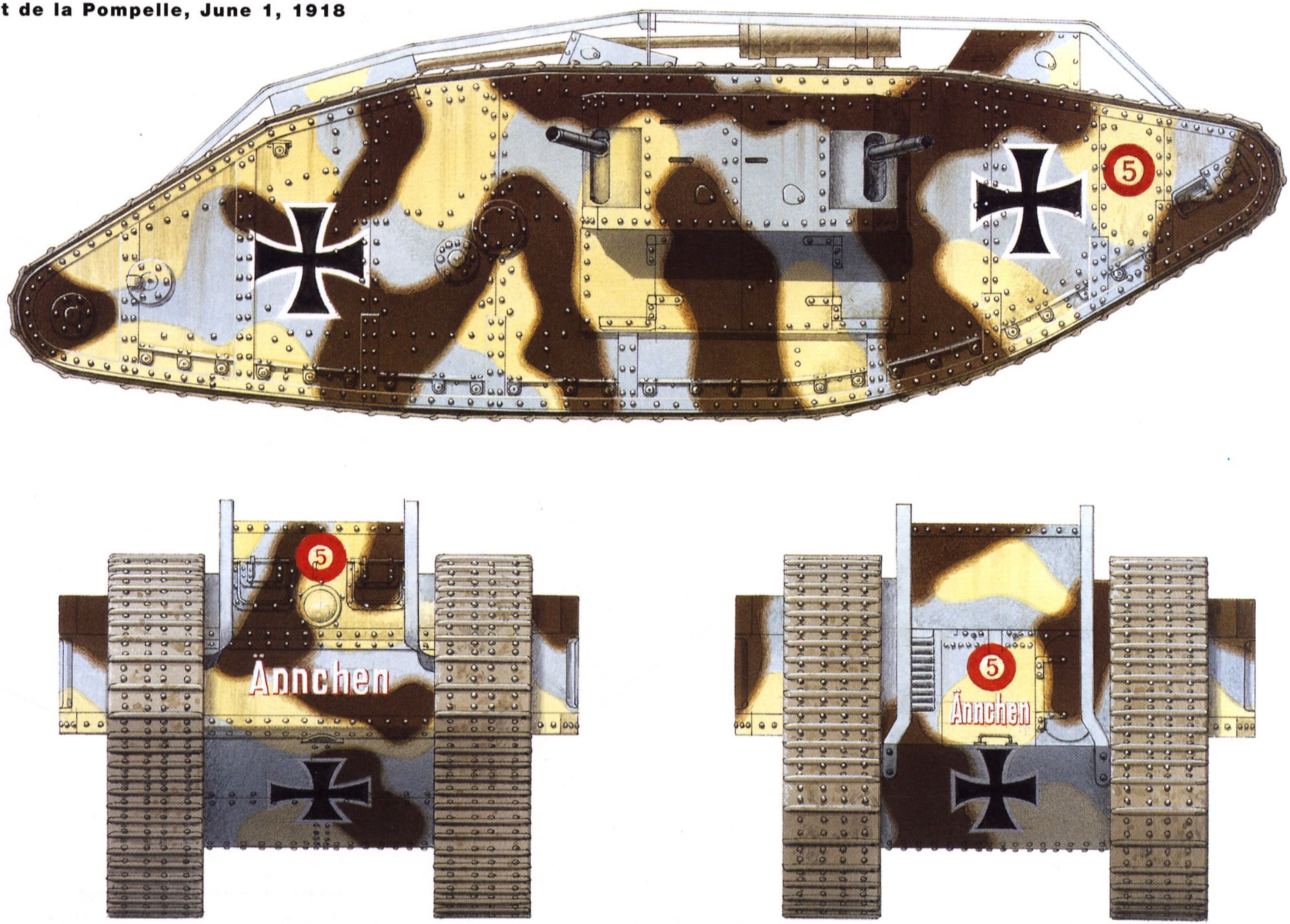
Performance: With heavy propellant charge: 4 miles (6.4km) range, initial muzzle velocity of 1,597ft/sec (487m/s)

Ammunition: 100 rounds (50 high-explosive, 30 armor-piercing, 20 grape-shot)

Secondary Armament: Six 7.9 mm Maschinegewehr 08

Ammunition: 40 to 50 ammunition boxes (10,000–15,000 rounds)

E: Beutepanzer 107 "Ännchen," Abteilung 12, Fort de la Pompelle, June 1, 1918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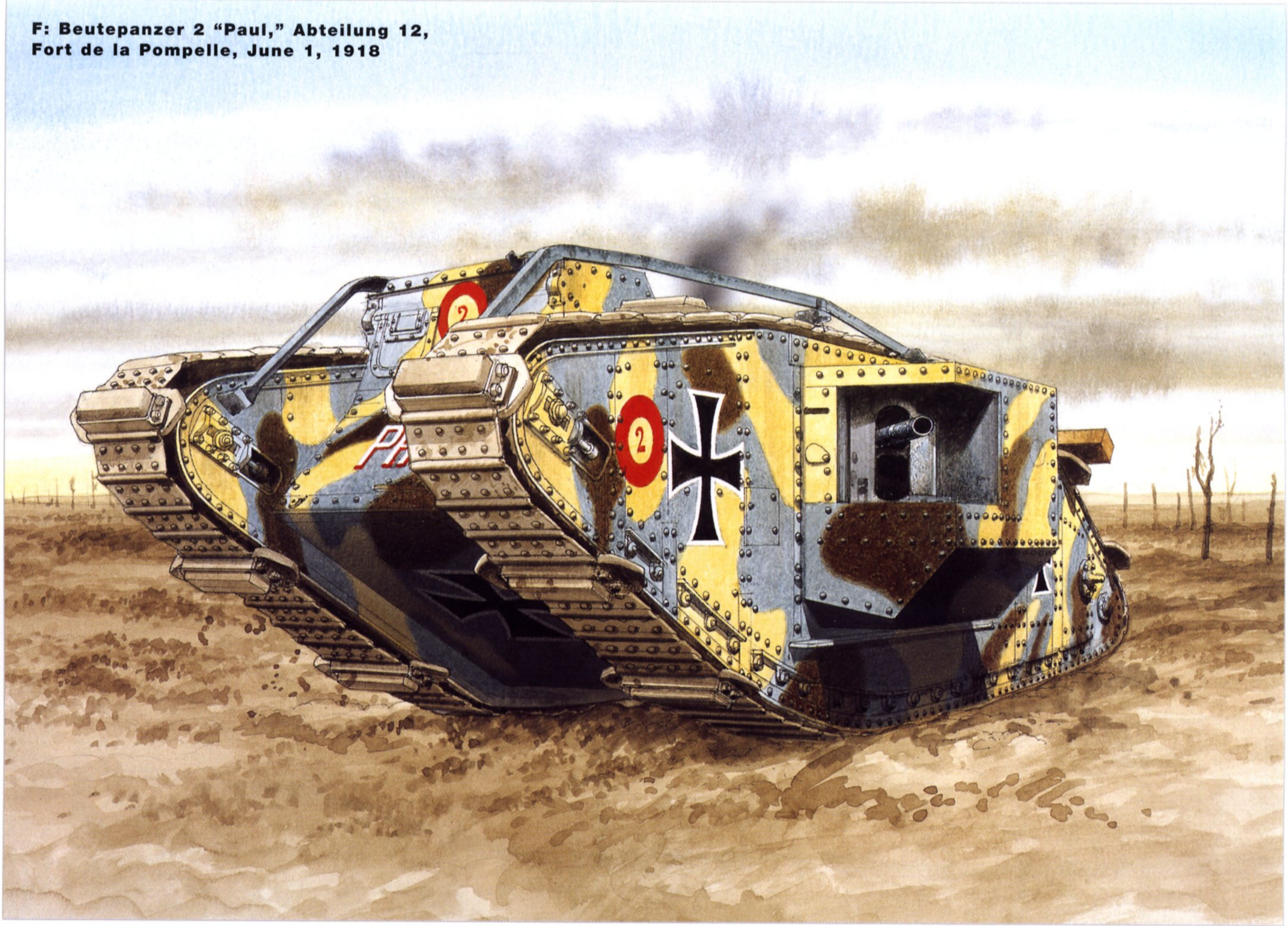
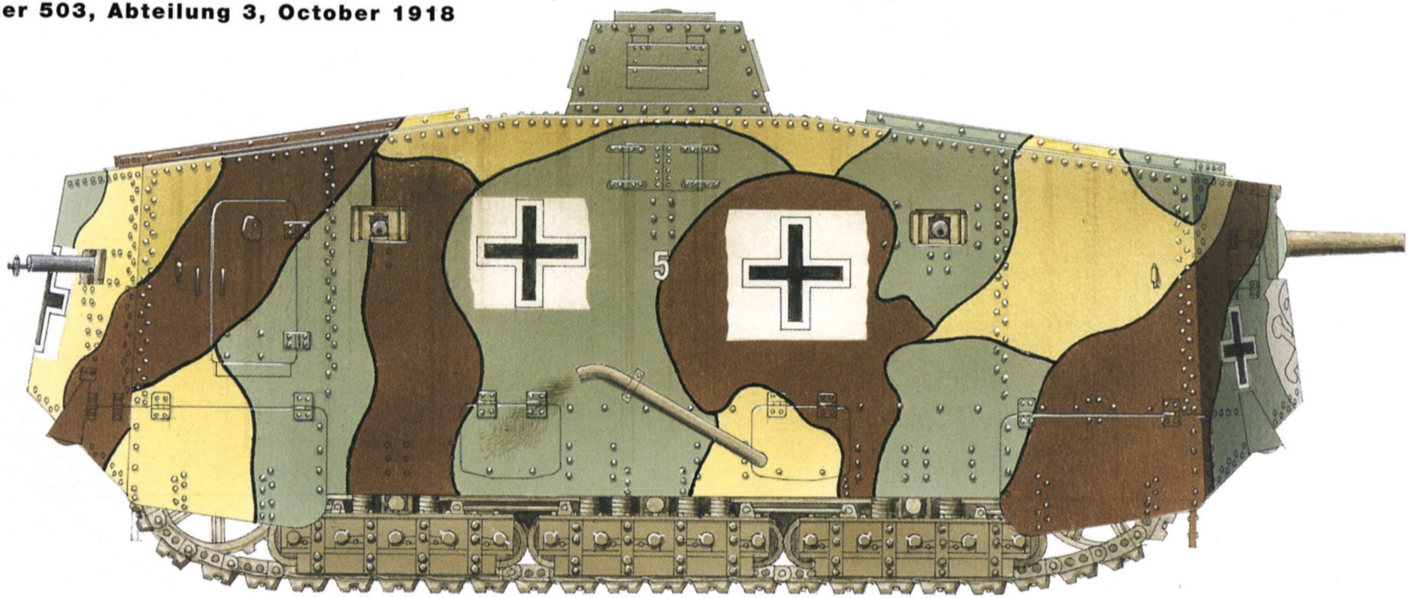


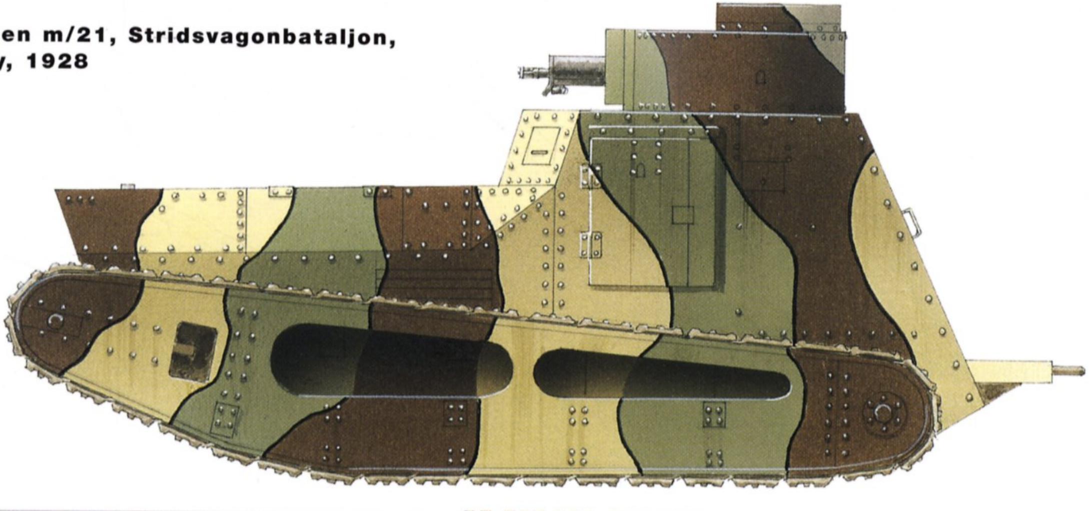
F: Beutepanzer 2 "Paul," Abteilung 12,
Fort de la Pompelle, June 1, 1918

G

G1: A7V-Panzer 503, Abteilung 3, October 1918



G2: Stridsvagen m/21, Stridsvagonbataljon, Swedish Army, 1928



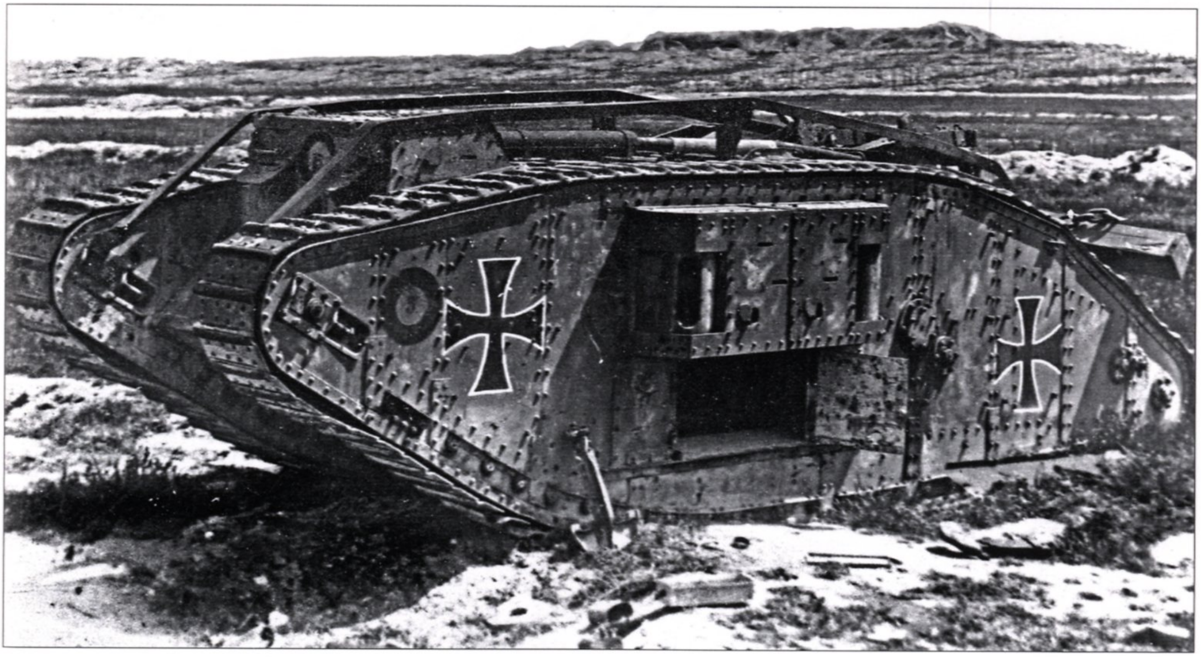
REBUILDING THE TANK UNITS

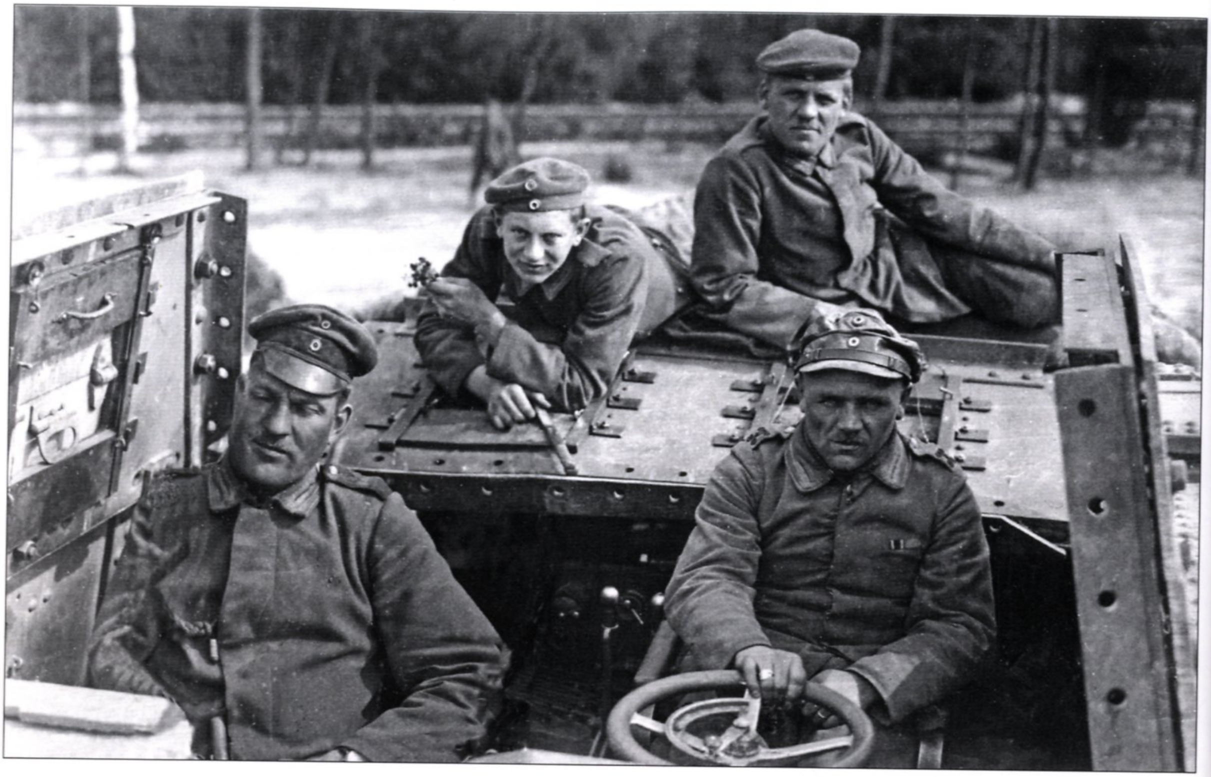
During mid-summer, the German tank force was compelled to take stock and rebuild. The steady loss of A7V tanks in combat actions reduced the strength of the three "German" tank units below the authorized five tanks, and the lack of spares forced the Charleroi depot to cannibalize two tanks for parts to repair the others. By the end of June, Abteilungen 1 and 2 were down to four tanks each and Abteilung 3 had two, while three of the older tanks with trestle mounts were off being refitted with pedestal gun mounts.

By the end of July, the Allies began to strike back. Following the French attack near Soissons, the British struck near Amiens on August 8 with 421 tanks in support of a massive attack. Ludendorff lamented that it was "the black day of the German Army" with some 27,000 German casualties, including 12,000 soldiers who had surrendered. Tank panic was becoming a real problem, and could only worsen with the proliferation of Allied tanks. As a result, the German tank units spent much of summer and early fall being used for training to accustom the weary German infantry to the presence of tanks.

The defensive posture of the German Army through the summer did not encourage the use of tanks, but in late August a limited counter-offensive was planned in the Cambrai area. The subsequent tank action was a fiasco: Abteilung 1 lost two of its tanks before it reached the start line and the others were so delayed they saw no action. Abteilung 2 was able to launch the attack with three of its four tanks, but the accompanying Bavarian infantry had not been expecting tank support and did not accompany them forward. After a short engagement with some New Zealand troops, Abteilung 2 returned to the German lines. German artillery did not realize they were friendly, knocked two out, and damaged a third. The A7V units were not committed again until the autumn.

Another view of Panzer 107 Ännchen after it was abandoned near Fort de la Pompelle on June 1, 1918. (NARA)





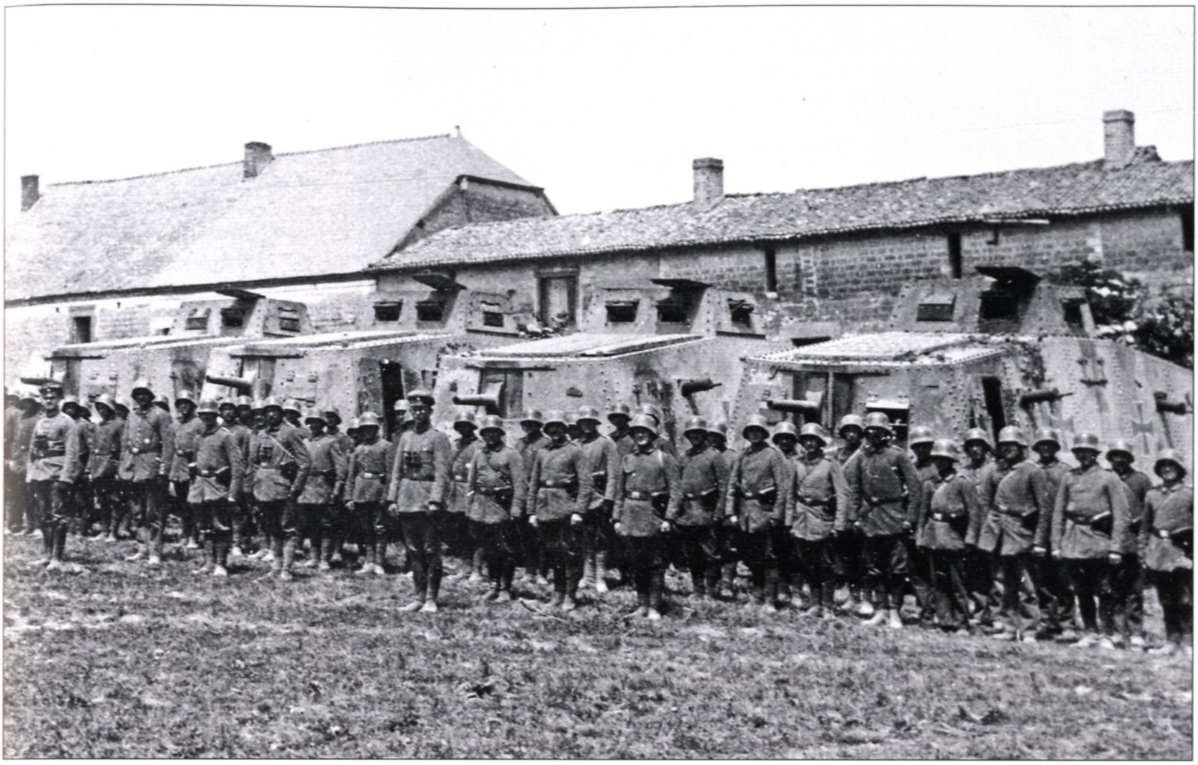
By the end of June, the future prospects of the captured-tank units were more favorable than those of the A7V units, since about 300 derelict British tanks were behind German lines following the spring and summer fighting. About 40 of these were mostly intact, and by June 30 the recovery teams from BAKP 20 had managed to move 85 British tanks to the Charleroi plant and to cannibalize another 48 tanks. In early August 1918, Chefkraft estimated that 170 captured British tanks could be refurbished, but this was beyond the limited capacity of BAKP 20. As a result, firms in Germany were contracted for rebuilding work. The availability of such a large number of captured tanks and the end of A7V production prompted the War Office to disband the embryonic Abteilungen 4 through 7, and their troops were used to reinforce captured-tank units. By summer, two new captured-tank units were training, Abteilung 13 and Abteilung 15, and a further seven were authorized, Abteilung 16 to 22. By the end of the war, there were only enough tanks for seven captured-tank units – Abteilungen 11 to 16.

During the early summer, a steady stream of 57mm Maxim Nordfeldt QF guns on pedestal mounts arrived in Charleroi from the Spandau artillery workshop, permitting the re-equipping of all Mark IV Male tanks in German service with this weapon. On June 5, OHL ordered that all Mark IV tanks, including the Females, be armed with the 57mm gun, but few, if any, Female tanks were in fact converted. BAKP 20 did find a way to replace the bow machine gun in the Mark IV Female with the 13mm T-Gewehr antitank rifle to give it some modest antitank capability.

In spite of the growing dependence on captured British tanks, the German assault units most closely associated with the Panzer force, Sturmbataillon 5 and Jäger Sturmbataillon 3, were not at all happy with

ABOVE **The roof of the command cupola could be removed and the front and rear panels folded down to make it easier to drive the A7V when outside the combat area. This is the crew of Panzer 563 "Wotan" during a rail movement in July 1918. Like the rest of the final production batch, Wotan was fitted with appliqué armor on the cupola. (NARA)**

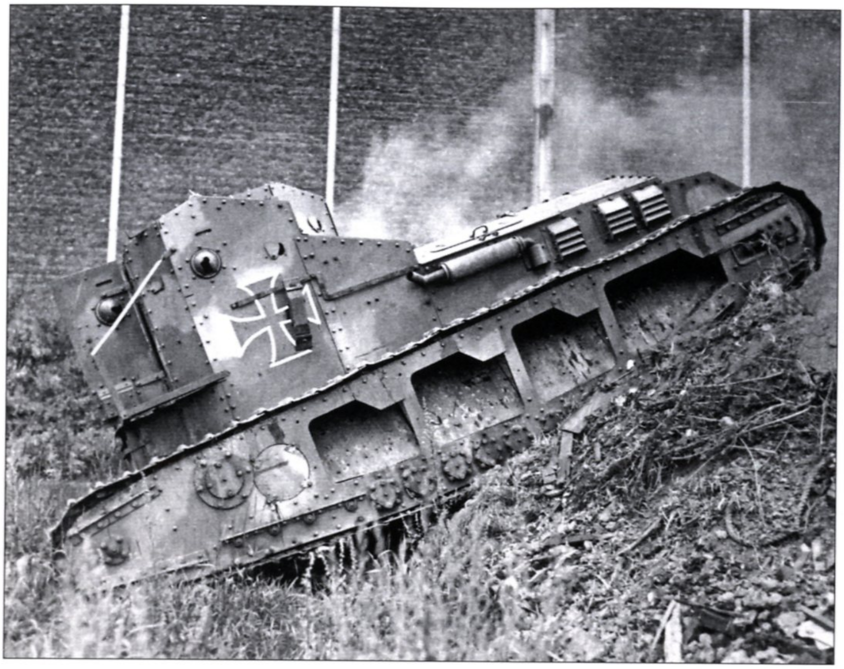
OPPOSITE **Although some French tanks were captured intact, they were not used by the Panzer units. This Renault FT named "Hargneuse III" is seen between two Abteilung 14 tanks, "Heinz" on the left and "Liesel" on the right in May 1918, shortly before both these captured Mark IV tanks were lost in the fighting around Fort de la Pompelle. (NARA)**



ABOVE **Abteilung 2 is seen here in the summer of 1918 during training near Reims. The tanks are, from left to right, "Wotan" (563), "Hagen" (528), "Siegfried" (525), and "Schnuck" (504). (NARA)**

them. The commanders of both units felt that the Mark IV was ill suited to the new German combined-arms assault tactics, since the Mark IV simply could not keep pace with a fast-advancing infantry unit.

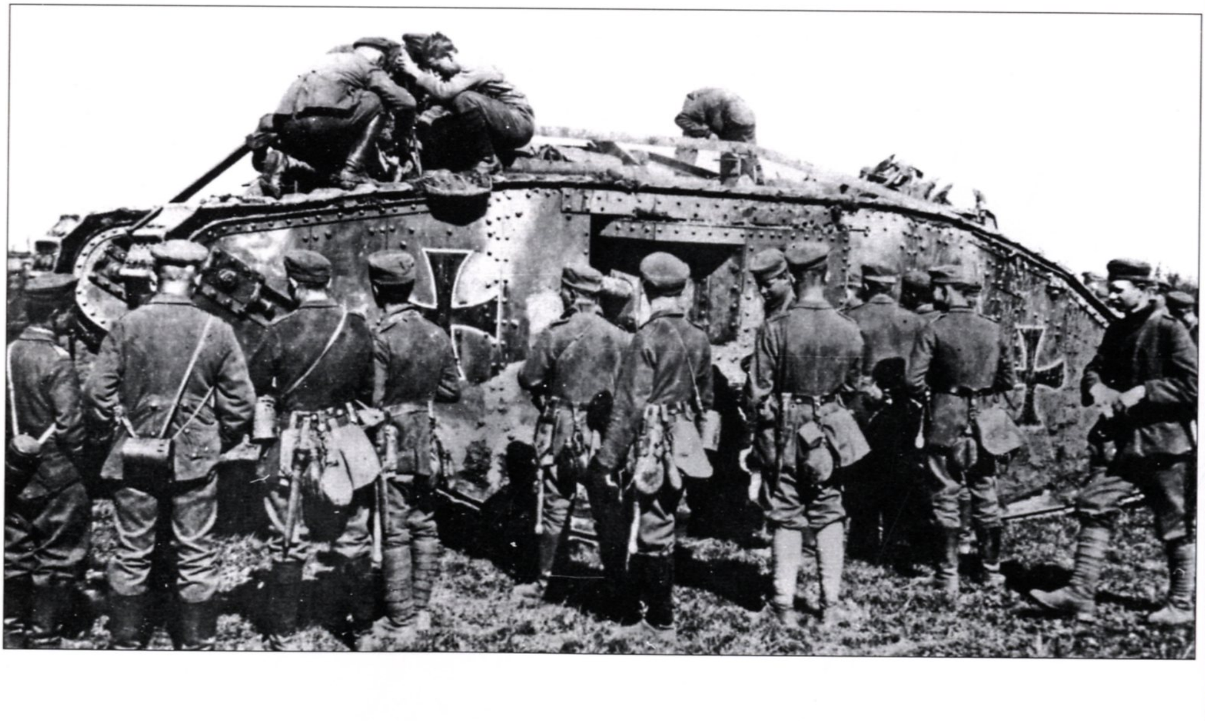
The Germans managed to capture other types of tank during the summer fighting, but did not make regular use of them. The French Schneider and St Chamond tanks were both regarded as inferior to the A7V in mobility and they were usually left on the battlefield. There were



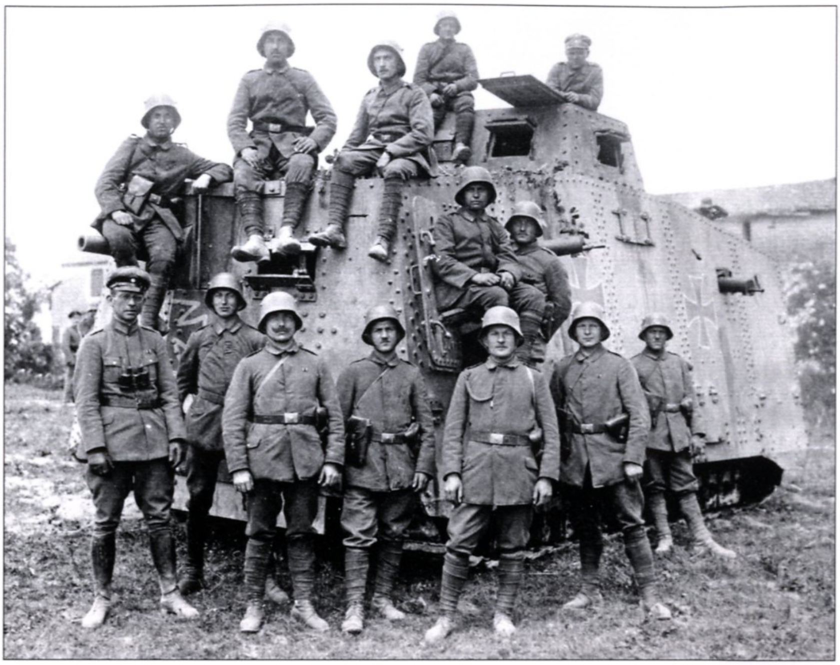
At least two Whippet tanks were put back in running order at the BAKP 20 facility in Charleroi. Although the type was highly regarded by Capt Friedrich Bornschlegel, the commander of the German tank units, the type was not used in combat by the German tank units in 1918. (NARA)

some instances of German infantry capturing French tanks intact and using them in combat until they broke down or were knocked out. The first intact Renault FT was captured in early May and sent to Charleroi, but it was not well regarded due to its poor trench-crossing ability. At least two Whippet tanks were captured in the spring fighting and they were rebuilt at Charleroi. Although the Whippet was well regarded by the German tank units, it was not put into German service due to the preference for gun armed tanks.

German infantry look on as a captured Mark IV Male tank is prepared by its crew. (NARA)

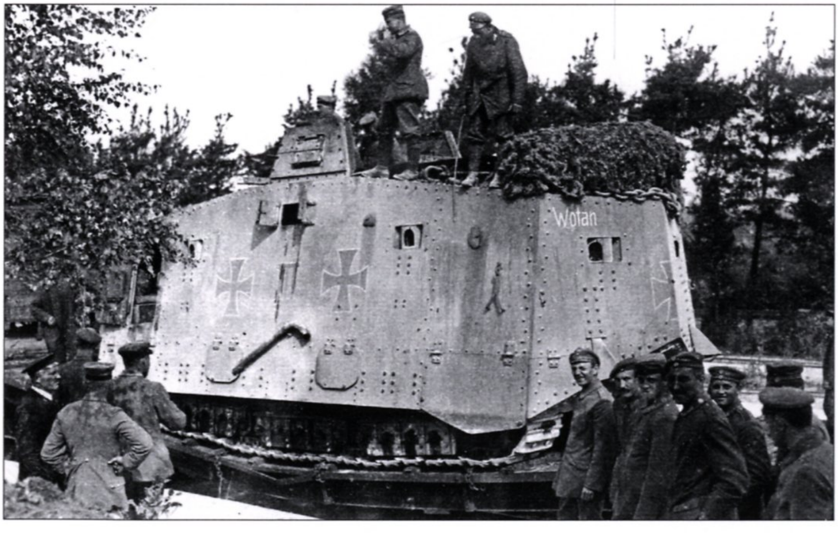


Lt Müller and the crew of Panzer 504 "Schnuck" pose in front of their tank during a demonstration by Abteilung 2 in the summer of 1918. This photo shows the distinctive multipanel Krupp armor of one of the early production batches. Schnuck had to be rebuilt with chassis 544 due to problems with its original chassis. (NARA)

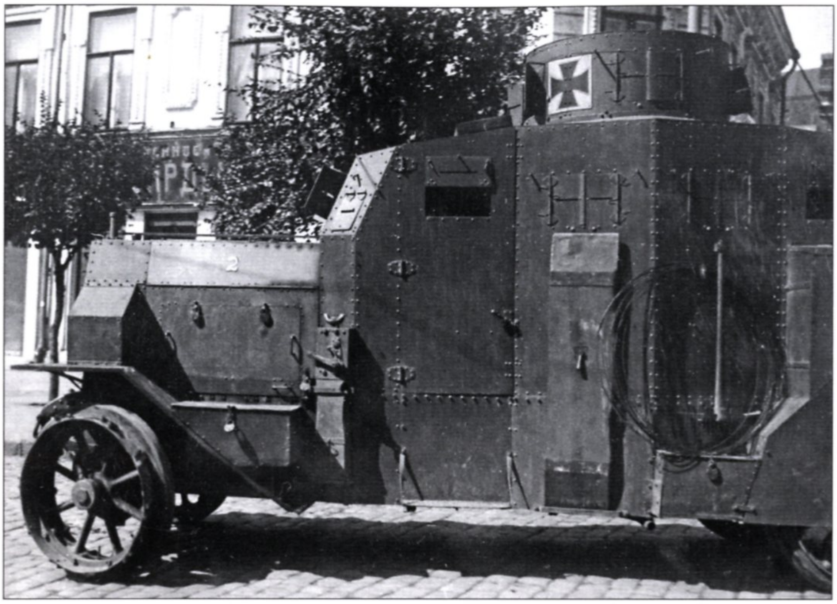


GERMAN ARMORED CARS IN COMBAT

The German Army finally decided to begin serial production of armored cars in 1917 for use on the Russian front. The War Ministry placed an order for 12 Erhardt E-V/4 vehicles, the first vehicle being delivered in July 1917. This permitted the formation of Panzerkraftwagen-MG-Züge 2 through 6 in the autumn of 1917. With the collapse of the Russian Army in late 1917, the conditions in the east became fluid, with German units involved in occupation duties and skirmishes with local militias. Under these conditions, the armored cars were very valuable as a rapid-deployment force, leading to a call for more such units. The armored car units were quite small, usually only two armored cars plus supporting automobiles.

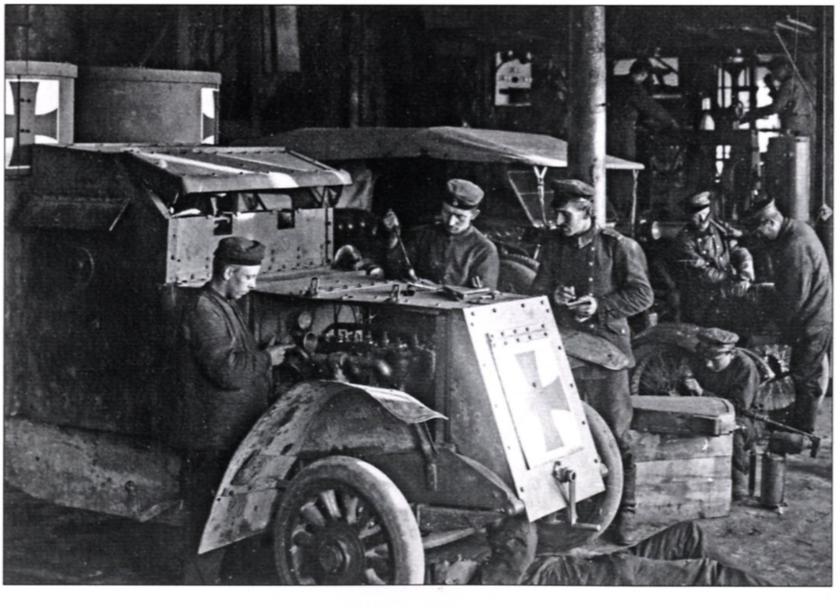


The A7V was transported by rail whenever possible as it was not durable enough for prolonged road marches. Here, Panzer 563 "Wotan" of Abteilung 2 is loaded on a flatcar during July 1918, with the panels of its cupola folded open. (NARA)



German tanks were never deployed on the Russian front, but there was a proliferation of armored car units there in 1918 for occupation duty. This is an Erhardt E-V/4 1917 on patrol in Rostov in Russia in 1918. (NARA)

In February 1918, PzKw-MG-Züge 1 and 2 were deployed on the Eastern Front, serving with Army Group Kiev in Ukraine. Three new Erhardt armored car platoons were deployed with the 8th Army in the Baltic: PzKw-MG-Züge 4, 5, and 6, while a fourth, PzKw-MG-Zug 3, served first in Italy before being sent east in May 1918. As in the case of the later tank force, the small quantity of German-manufactured armored cars, as well as combat attrition, led to the adoption of captured armored cars to fill out the numbers, mainly Russian and British cars, but also the occasional Italian and Belgian vehicle. Some of the units were formed on the Italian front, such as PzKw-MG-Züge 10 and 11, using captured Italian Lancia armored cars. In August 1918, the total armored car strength reached 11 platoons, about half using captured vehicles.

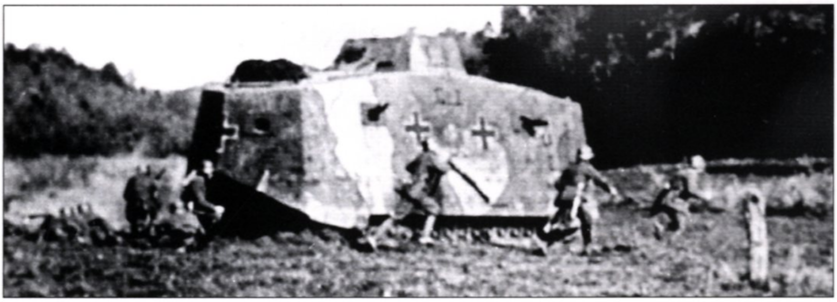


As was the case with German tank units, German armored car units were heavily dependent on captured armored cars like this Russian Austin. This type was used by several PzKw-MG-Züge in 1918. (NARA)

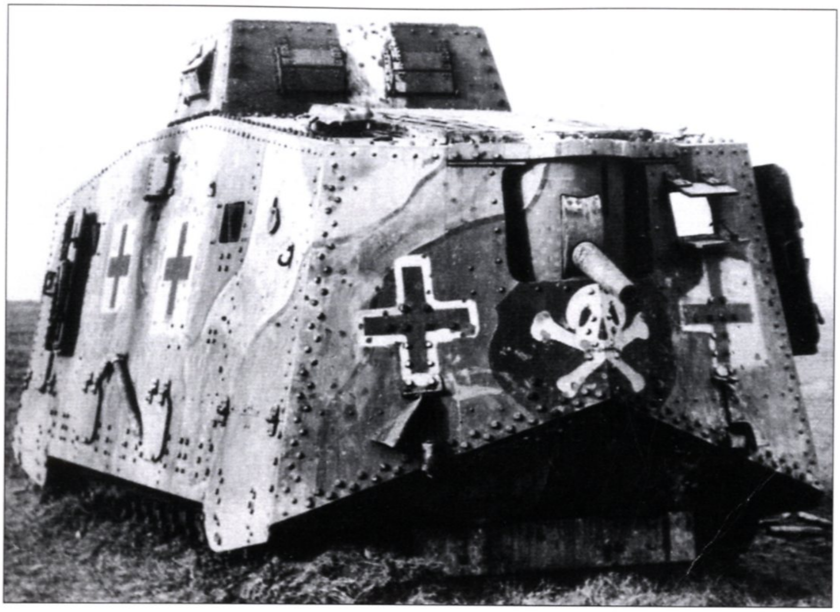
FINAL TANK BATTLES

By September, the German Army had withdrawn behind the Siegfried position, a defensive line better known to the Allies as the Hindenburg Line. With no further offensive operations likely for the foreseeable future, the OHL considered other possible uses for the tank units, which at the time numbered 12 A7V tanks and over 36 Mark IV tanks in nine units. There was a general recognition that the units were too small in size to be effective, and there were plans to consolidate all the A7Vs to form a battalion-sized formation. On September 24, 1918, the OHL ordered all nine units to concentrate in the area behind Army Group-German Crown Prince to act as a mobile strategic reserve that would be used to repulse any major Allied break through the Siegfried position. This scheme was short-lived and instead only one A7V unit and four captured-tank units were shifted to the 17th Army, while the rest were to remain behind the lines undergoing antitank training with the infantry.

After an abortive attack near St Etienne on October 7, 1918, Abteilung 3 was ordered back to the Charleroi depot for repair. At the time, the BAKP 20 was being evacuated to Wiesbaden in Germany, so Abteilung 3 accompanied it. By late September, Abteilung 1 and Abteilung 2 were down to only six A7V tanks, so they were consolidated under the control of Abteilung 1. To help resist an expected Allied breakthrough near Cambrai, the unit was moved near the city in early October. On October 11, British infantry broke through near Iwuy and Rieux and Abteilung 1 and Abteilung 13, with three Mark IV tanks, were ordered to counter-attack in support of German infantry. Abteilung 13 failed to reach the start line after losing two tanks to mechanical problems. Abteilung 1 attacked the advancing British troops, who were surprised to encounter tanks and quickly fell back. The German infantry commander was very impressed by the performance of Abteilung 1, noting that “the tanks thrust forward in a bold, single action and caused heavy losses to the enemy thereby fundamentally supporting our infantry attack. The total failure of the enemy's attempt to breakthrough 12km deep is largely due to your young tank force.” The Iwuy–Rieux counterattack was the swansong of the A7V force. By mid-October the remaining tanks of Abteilungen 1 and 2 were in a perilous mechanical state due to battle damage and extended road marches. Since Charleroi was no longer functional, the tanks were transported to the Wiesbaden-Erbenheim racecourse to await attention. Eight A7V tanks remained there as Germany fell into defeat and social turmoil. The French found them there in mid-December 1918.



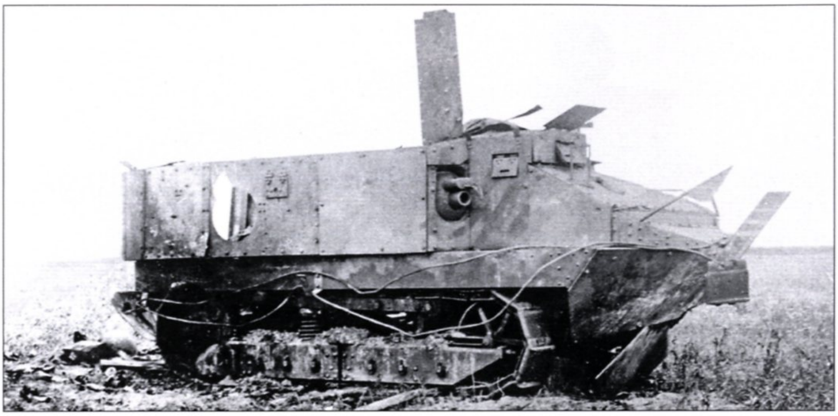
An A7V in action with German assault troops in the fall of 1918. In October, the tank units began to employ the simple Balkan cross as national insignia instead of the Maltese cross previously used. (NARA)



Panzer 503 of Abteilung 3 survived the final fall 1918 battles, but had to be abandoned at Charleroi when BAKP 20 evacuated to Wiesbaden in October 1918. The photo provides a good view of the new markings adopted on October 6, 1918, which were supposed to consist of a Balkan cross on a white square. This A7V was one of the early production batch with the trestle gun mount, later rebuilt with the pedestal mount as seen here. (Patton Museum)

In early October 1918, some captured-tank units were shifted closer to the front to serve as a counterattack force in place of the A7V units. On the night of October 1–2, Abteilung 11 was put out of action by an artillery barrage that disabled four tanks. On October 8, 1918, Abteilung 15 was ordered to support an infantry counterattack near Maison Neuve. While approaching the town, Abteilung 15 encountered British tanks of A Company, 12th Tank Battalion. There was considerable confusion on both sides as the Germans thought the tanks might belong to neighboring Abteilung 16, while the British thought they might be from neighboring C Company. When they had closed to about 45m, both sides finally realized their identity and a wild melee began. British Mark IV L16 fired on the lead German tank and hit it with a 6-pdr round near the track without stopping it. In return, L16 took two 57mm rounds from Panzer No.2 of Abteilung 15 and was abandoned. L9 was also hit repeatedly by Panzer No.2 and finally abandoned, and L12 was hit twice and put out of action. L8 had three of its machine guns out of action and a radiator leak, so it was abandoned. The L8 commander, Lt Martell, discovered an abandoned German field gun and, with the help of another officer, aimed it at a second German Mark IV emerging from the village, hitting it in the fuel tank and knocking it out. Panzer No.2 withdrew since all of its weapons had been damaged and its commander seriously wounded. From accounts by one of the gunners on Panzer No.2, it is not clear whether all four British tanks were knocked out by the German tank; some might have fallen victim to German field guns supporting the counterattack.

In the meantime, two German Mark IV machine gun tanks moved southeast of Maison Neuve, where they ran into L34 of C Company and engaged in a fruitless exchange of machine gun fire. The German tanks finally gave up and withdrew, but one was hit by an artillery round. The German tank attack stopped the British infantry advance and managed to disable four British tanks for a loss of two of their own. Neither Abteilung 15 nor A Company, 12th Tank Battalion, had any serviceable tanks by the end of the day.



Although German tank units did not use captured French tanks, on occasion German infantry units would employ tanks they had captured. This Schneider CA.1 tank was used in an attack against the US 1st Infantry Division on July 20, 1918, near Froissy, where it was destroyed by 75mm field guns of the divisional artillery. (NARA)

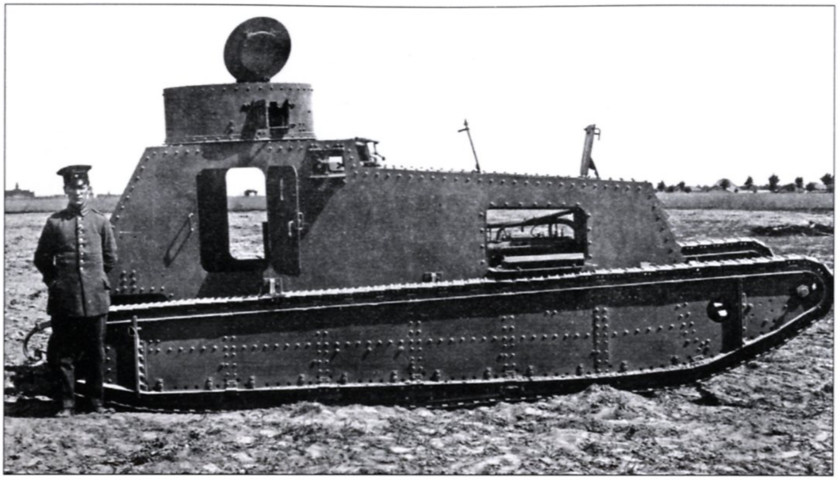
Neighboring Abteilung 16 had far less success while supporting a German infantry counterattack near Séranvillers. Its three tanks ran into a British infantry column supported by tanks of C Company, 12th Tank Battalion. Two British Mark IV Male tanks confronted the German unit's two machine gun armed Mark IV tanks and quickly knocked them out. The third German Mark IV did not encounter any British tanks and spent its time shooting up British infantry positions around Séranvillers with grapeshot and machine gun fire before running out of ammunition and withdrawing. The following day, both Abteilung 15 and Abteilung 16 were ordered back to Charleroi with the surviving seven Mark IV tanks, but three were left behind after they broke down.

The last German tank action of the war occurred on November 1, 1918, when Abteilungen 12, 13, and 14 were deployed to support a counterattack by the 28th Infantry Division near Sebourg. Between them, Abteilungen 12 and 13 fielded only five Mark IV tanks, and only three made it past the start line. Both of the Abteilung 12 tanks were disabled by British artillery and the sole Abteilung 13 tank lagged so far behind the assault troops that it never saw combat. Surviving tanks from the three units were sent by train to the Wiesbaden area, by which time the German Army was on the verge of disintegration and revolt.

PLAN 1919

The growing use of tanks by the Allies, particularly in the summer 1918 fighting, forced the OHL to reconsider their position on their infant tank force and give tank production a greater priority. The overall objective was to field 400 heavy tanks and 4,000 light tanks in 1919. However, there was little consensus on which type of tank was really needed, as both the A7V and captured Mark IV tank had proven to be flawed when used in combat. The monstrous K-wagen had entered production but only two were nearing completion at the Riebe plant out of the ten ordered, and neither were finished by the time the war ended in November 1918. One K-wagen was close enough to completion that the plant wanted to put it on trials, but the Allied Control Commission refused and both were broken up in the plant in 1919.

Vollmer's LK I light tank appeared to be the most promising of the new designs, and the prototype entered trials in March 1918. It was designed

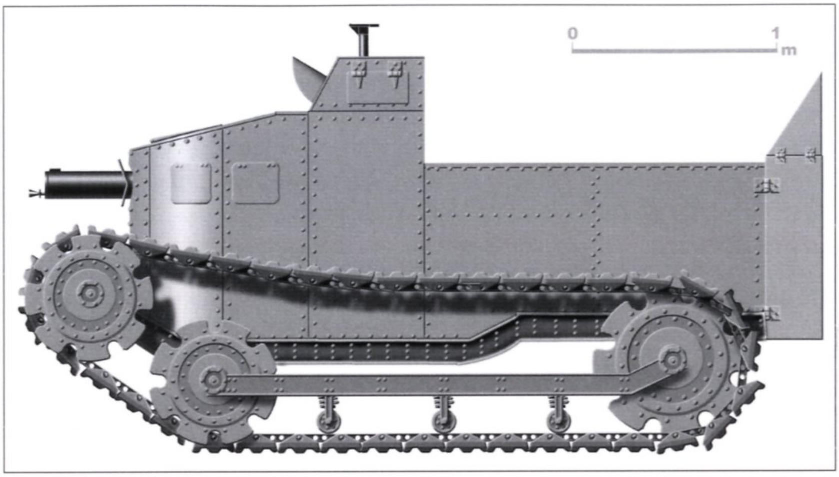


This single LK I light tank was constructed in 1918, but the armor was unacceptably thin. Plans were underway in the fall of 1918 to build the improved LK II but the war ended before any were ready for army service. (Patton Museum)

to be simple to produce, being based around existing automobile chassis frames and engines but with differential braking for steering. The army was not entirely happy with the design, wanting thicker armor to resist close-range rifle fire. This led to the construction of prototypes of the improved LK II on a Daimler chassis. Two versions of the LK II were envisioned, a turreted machine gun tank and a gun tank with a 57mm gun in a fixed casemate. The OHL approved production of the LK II on June 23, 1918, ordering 580 tanks. The plans were to field these in new battalion-sized formations. There were continued concerns over shortcomings in the LK II design, which Vollmer addressed in the improved LK IIIs. This tank reversed the configuration of the LK II with the casemate forward, and a 20mm TUF automatic cannon was its proposed armament. Although there were schemes to build as many as a thousand LK IIIs, the war ended before even a prototype was completed. A few LK IIs were nearing completion at Daimler in November 1918, but none reached the army. In 1921, secret talks were conducted between the German and Swedish governments and components for ten partially completed LK IIs were sold to Sweden in August–September 1921. Joseph Vollmer assisted the Swedes in reconstructing the tanks, which were designated as Stridsvagen m/21. They served for many years, later being upgraded to the m/21-29 configuration.

Krupp offered an unconventional tankette design, the leichte Kraftprotze, that was similar to postwar machine gun carrier ideas. It had a crew of two, was armed with a single Maxim 08 machine gun, and had folding armored shields at the rear to provide cover for infantry that were expected to advance behind it. Twenty of these were ordered on June 13, 1918, but it would appear that the prototype was never completed.

There were a number of other designs and proposals that reached the paper stage but never entered production. One of the most impressive was a heavy tank design from Oberschlesien Hüttenwerke in Gleiwitz with a turreted 37mm gun and two auxiliary machine gun turrets. It is very reminiscent of later medium tank designs such as the British Independent or the Soviet T-28. Two prototypes were ordered but never completed. There were also a number of proposals made in the summer of 1918 simply to copy the British Mark IV tank. In April 1918, Chefkraft reported that it could deliver the first 60 tanks by February 1919 and 240 by the summer

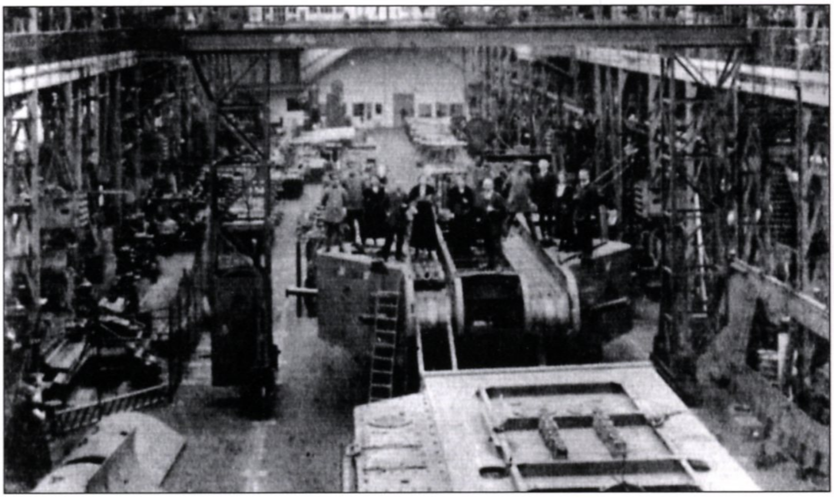


A total of 20 Krupp leichte Kraftprotze tankettes were under construction when the war ended. No known photos survive; this illustration shows their configuration. (Author's collection)

of 1919, but the plan was vetoed by Col Bauer of the OHL, who at this stage favored light tanks as being less disruptive to the overextended German armament industry.

After the November 1918 armistice, the Allies forced the Germans to dismantle their infant tank force. A handful of tanks were used by militias in the street fighting of 1919–21, and a pair of Gelandwagen were converted into an improvised tank design resembling the A7V. The popular myth that five A7V tanks were sent by France to the Polish Army to take part in their war with the Bolsheviks in 1920 is not true. The postwar Reichswehr was not allowed to have tanks, though police units were allowed to have limited numbers of armored cars.

The German Panzers of World War I made a negligible contribution to the combat operations of the German Army compared to the important consequences of British and French tank operations. Unlike Petain in France, Ludendorff failed to appreciate that tanks provided a vital psychological crutch to the beleaguered and battered infantry, giving them a new-found confidence that they could finally prevail against an entrenched enemy armed with machine guns. Arguably, the lessons of the 1918 tank operations were not fully understood until the 1930s with the



Two K-wagen heavy tanks were under construction at the Riebe plant near Berlin. Although one was ready for trials, the war ended before it ever left the factory. Under the watchful eyes of the Allied Control Commission, both were broken up. (NARA)

rise of the new Wehrmacht. In assessing the lessons of World War I, German tacticians of the 1930s clearly recognized the need for tanks on the modern battlefield. The decision to build large numbers of light tanks in the mid-1930s, such as the PzKpfw I and PzKpfw II, was not a temporary expedient as is often claimed, but rather was a belated recognition that a large number of small tanks was a better solution than small numbers of large tanks like the wretched A7V of World War I.

FURTHER READING

The selection of books dealing with German armored vehicles in World War I is small, but generally of high quality. The Hundleby and Strasheim book remains the best and most detailed source in English. A superb and more recent treatment in German was prepared by the "Komitee Nachbau Sturmpanzwagen A7V," which constructed a full-scale replica of the A7V for the tank museum at Munster. There is also a series of articles on various German World War I tank efforts in the German magazine *Waffen Revue*, including issues 49, 52, 69, 70, and 71. Another excellent source of information is the Landships website (www.landships.freeservers.com).

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Kaufhold-Roll, Heinrich, *Die deutschen Radpanzer im Ersten Weltkrieg* (Biblio: 1996)
Koch, Fred, *Beutepanzer im Ersten Weltkrieg* (Podzun-Pallas: 1994)
Komitee Nachbau Sturmpanzerwagen A7V, *Sturmpanzerwagen A7V* (Bernard & Graefe: 2003)
Petter, D., *Die technische Entwicklung der deutschen Kampfwagen im Weltkriege 1914–1918* (Reichswehr: 1932)
Schneider, Wolfgang, and Rainer Strasheim, *Deutsche Kampfwagen im 1. Weltkrieg* (Podzun-Pallas: 1988)
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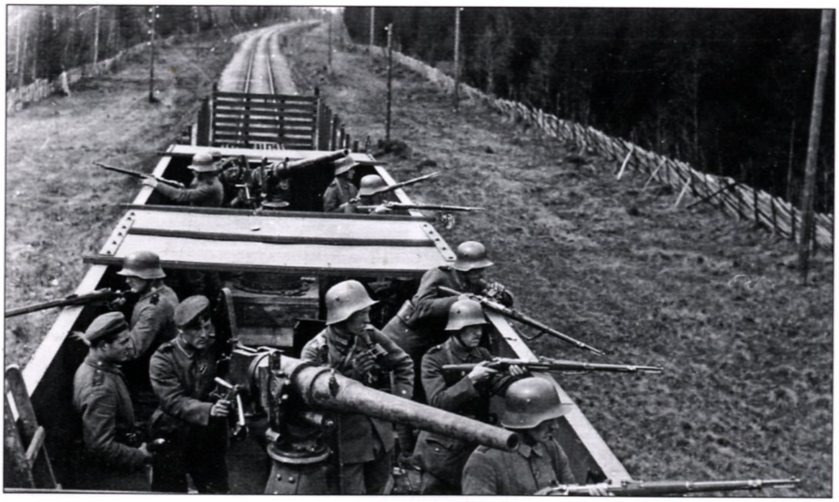


The German Army did not make extensive use of armored trains compared to the Austro-Hungarian or Russian armies. By the end of the war, seven German armored trains were operational. This particular armored train is seen in action in Finland on June 14, 1918, and is armed with what appear to be pedestal mounted 57mm guns. (NARA)

COLOR PLATE COMMENTARY

GERMAN TANK CAMOUFLAGE AND MARKINGS

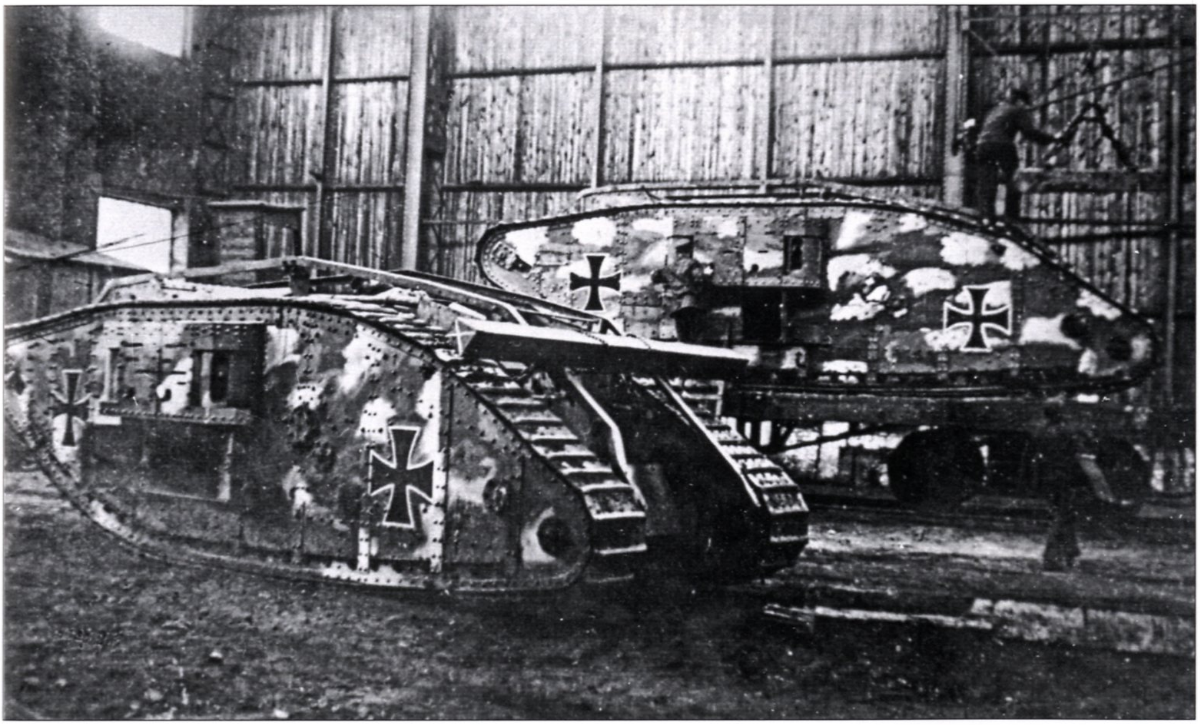
Very little written documentation about German tank camouflage and markings has survived, so written accounts tend to be conjecture based on broader patterns of German Army camouflage practice. The predominant camouflage color for German heavy ordnance in World War I was *feldgrau* (field gray). However, the army did not rigorously enforce color standards and field gray ranged from a medium to dark gray as well as from a cold, neutral gray to a distinctly greenish shade of gray, much like the uniform color. Photographic evidence from the Daimler plant suggests that the first batch of ten A7V tanks were finished in a dark color that has been interpreted to be a dark green; most likely it was a decidedly greenish and dark shade of field gray. The second batch of A7V tanks appear to have been finished in a more typical medium field gray. When issued to the troops, the vehicles were not camouflage painted. Camouflage paint began to be applied prior to the March 1918 battles, probably at Charleroi. The most probable colors were a clay yellow/ochre and red-brown/chocolate-brown colors. The color of the captured Mark IV tanks is a bit less certain. The first captured tanks were probably left in their original British dark khaki-brown, though most writers argue that by the time of the 1918 battles the captured tanks were being painted in German colors with a base coat of field gray and patches of ochre and brown. Evidence is scarce and the actual patterns employed on the tanks were not apparently based on any instructions but were improvised at Charleroi. In September 1918, a new *Buntfarben-anstrich* (multicolor paint) camouflage was ordered, usually painted in ochre, red-brown, and dark green and sometimes with the colors being divided by black lines.

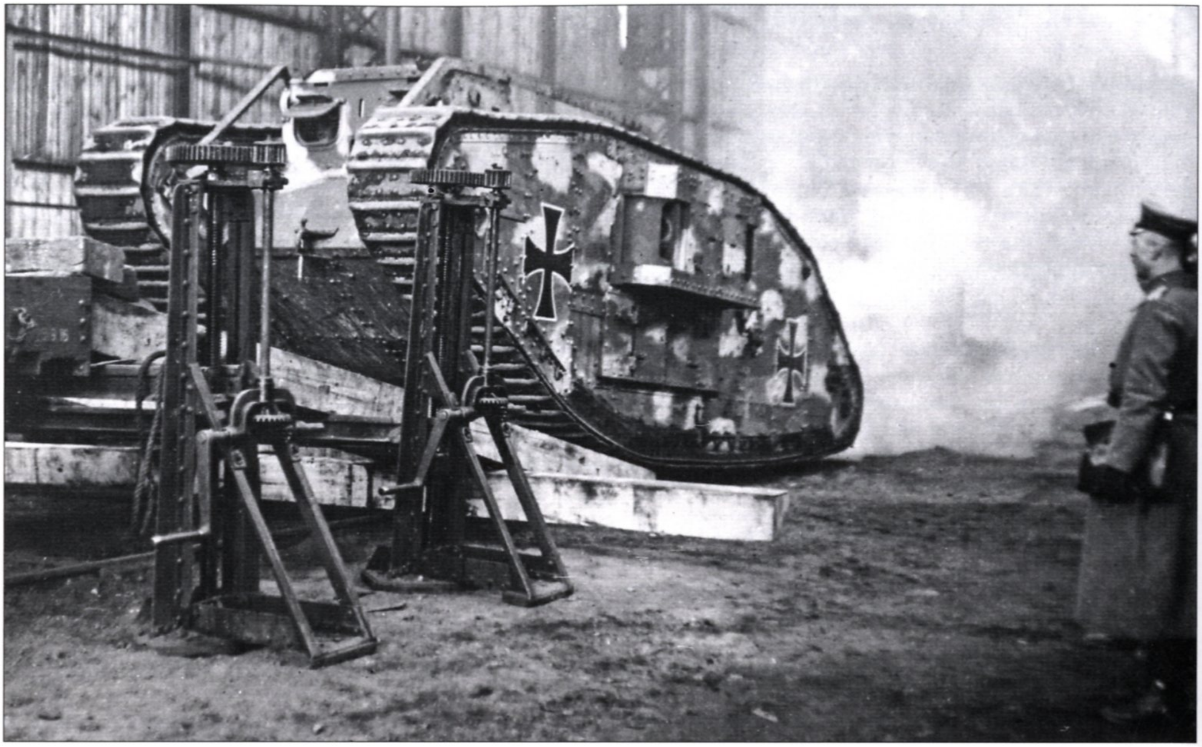
German tanks were prominently marked with the German national insignia, which was the Maltese cross in the early 1918 battles. This was painted clearly on the sides, front, rear, and top. Depending on time period and unit, the cross was carried on the side either once or twice. Initially, the vehicles carried their unit tactical number in Roman numerals I–V, and the pattern and location of this marking varied. In some cases, it was simply chalked on in white; on other occasions it was more carefully painted. In May 1918, a new system of markings was promulgated consisting of a ring in a color based on the traditional German Army code, with the tank's tactical number from 1–5 in the center. The colors were:

Color	A7V units	Captured-tank units
White	Abteilung 1	Abteilung 11
Red	Abteilung 2	Abteilung 12
Yellow	Abteilung 3	Abteilung 13
Blue	Abteilung 14	
Green	Abteilung 15	
Brown	Abteilung 16	

Tanks were often named, with the A7V usually carrying the name in white on the upper right front corner. The location on

This photo shows a good example of the type of camouflage applied to captured tanks at the Germaine plant in Charleroi by BAKP 20. These two Mark IV tanks are finished in a pattern of mustard and red brown over the base color of field gray, with Maltese crosses prominently carried for national identification. (NARA)





A refurbished Mark IV Female tank is driven on to a railroad flatcar at the Charleroi plant. (NARA)

captured Mark IV tanks varied; in some units on the glacis plate and rear plate, in other units on the hull sides behind the sponsons. Curiously enough, the German captured-tank units followed the British distinction of gun armed tanks as Males, and the machine gun armed tanks as Females, and so the names followed this pattern. Some units adopted distinctive insignia of their own, such as the skull and crossbones of Abteilung 1.

Following the August fiasco when two A7V tanks were mistakenly knocked out by Bavarian artillery, on October 3, 1918, OHL ordered that all tanks would be painted white for recognition purposes. This was obviously impractical and so on October 6 the instructions were interpreted to mean that the national insignia would be painted on a more visible white background. This instruction was not universally carried out. At about the same time, the German national insignia switched from the Maltese cross to the simpler Balkan cross, and the previous pattern of tactical ring markings was dropped in favor of simple Arabic numbers on the hull side.

A: A7V-PANZER 506 "MEPHISTO," ABTEILUNG 3, GRUPPE UIHLEIN, VILLERS-BRETONNEUX, APRIL 1918

Mephisto provides a fairly typical example of the early style of markings and camouflage, with a pattern of ochre and brown over the base color of field gray. Mephisto was particularly distinctive because of its cartoon, a running devil with a British Mark IV tank under its arm. Ironically, it was the first A7V captured by the British.

B: A7V-PANZER 561 "NIXE," ABTEILUNG 2, GRUPPE STEINHARDT, VILLERS-BRETONNEUX, APRIL 1918

This is how Nixe probably appeared when it was involved in the first tank-vs-tank battle on April 24, 1918. Like the second production of tanks, the color scheme is somewhat grayer and lighter than the first production batch. Markings were fairly typical, but Abteilung 2 at the time had their tactical markings chalked on the front and rear on either side of the cross.

C1: A7V-PANZER 560 "ALTER FRITZ," ABTEILUNG 1, MAY 1918

Alter Fritz shows the later style of tactical markings adopted in May 1918 using the tank number within a colored ring. The tank carries the skull and crossbones insignia, so typical of Abteilung 1, on the bow. The painted splinter camouflage is somewhat atypical. The commander of this tank, Ernst Volkheim, later went on to become the premier historian of the German World War I tank force and during the 1940 campaign, commander of Panzerabteilung z.b.V.40, the special armor unit assigned to the Norwegian campaign.

C2: A7V-GELANDWAGEN, ARMEE KRAFTWAGEN KOLONNE (RAUPE) 111, NORTHERN FRANCE, 1918

The Gelandwagen were painted in much the same field gray colors as the tank versions, though they were seldom camouflage painted. This example is in the same darker/greener shade of field gray typical of the first batch of A7Vs. The unit insignia of the AKK(R) 111 was a swastika inside an octagon, which has no specific connection to the later Nazi symbol. The imperial eagle crest is painted on the side, and there is a license plate painted on the front left side.

D: A7V-PANZER 563 "WOTAN," ABTEILUNG 2, 1918

This plate depicts Wotan, the next-to-last production tank. The illustration is based on the reconstruction of the A7V for the Munster Tank Museum in regard to the coloring of components. By this stage of the production run, the tanks appear initially to have been finished in a cold medium-gray variant of field gray, prior to having camouflage color added at Charleroi. The colors of interior components depended largely on the suppliers, with some components arriving in a greenish shade of field gray, and other components, such as the gun and pedestal mount, in an entirely different camouflage color.

E: BEUTEPANZER 107 "ÄNNCHEN," ABTEILUNG 12, FORT DE LA POMPELLE, JUNE 1, 1918

Ännchen is in the usual Charleroi scheme of ochre and brown over field gray. Abteilung 12 painted the tank names on the front and rear, and this example shows the use of colored tactical markings to good effect, being carried on the hull front, side, and rear.

F: BEUTEPANZER 2 "PAUL," ABTEILUNG 12, FORT DE LA POMPELLE, JUNE 1, 1918

Paul is a good example of a captured Mark IV that incorporated some of the improvements in the basic design such as the track extensions and spuds to improve traction in soft soil. The pattern of camouflage and markings is typical of the Charleroi vehicles and the vehicle carries the standard tactical markings for this period.

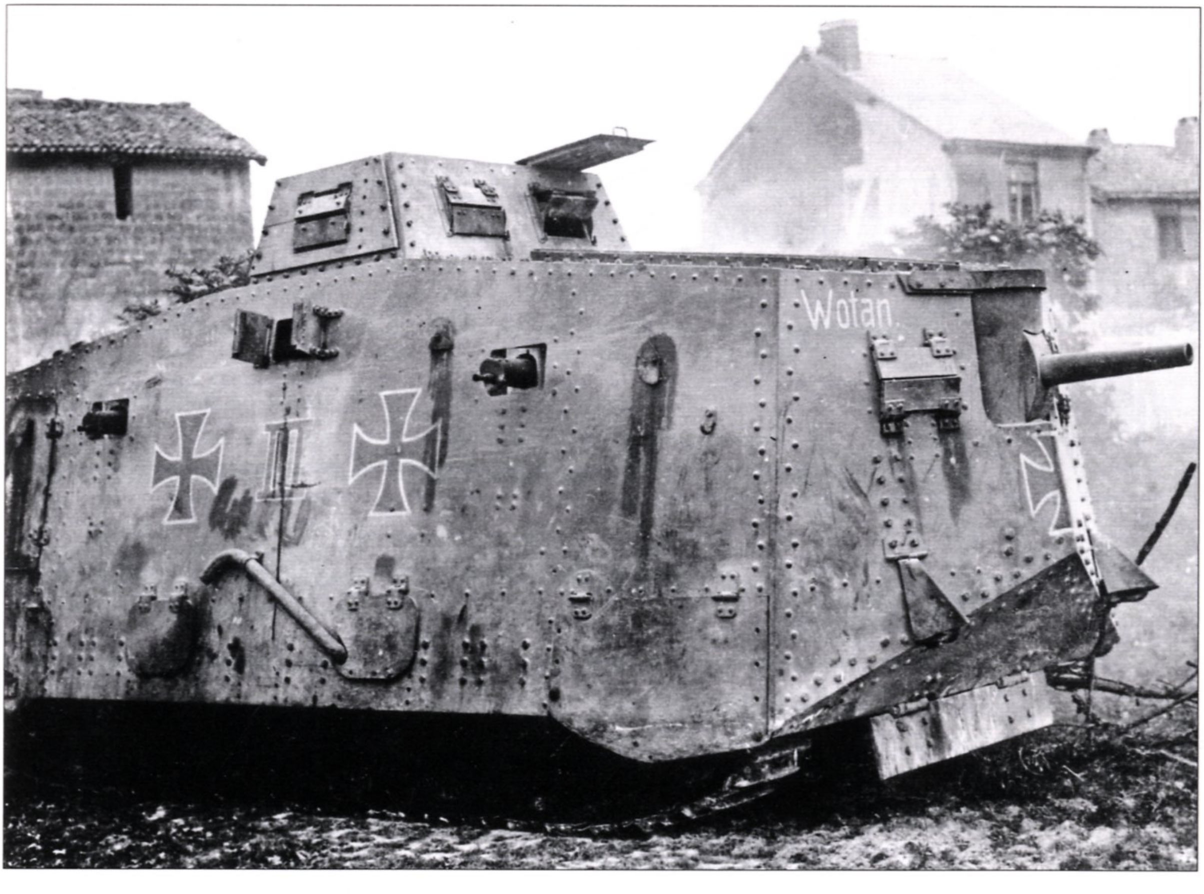
G1: A7V-PANZER 503, ABTEILUNG 3, OCTOBER 1918

This vehicle provides a view of changes in markings and camouflage adopted in October 1918, including the new multitone camouflage with black lines separating the three colors, the Balkan cross on a white background, and the simple white tactical number on the hull side. Panzer 503 had originally served with Abteilung 1, and here is seen with the insignia, since by this stage of the war the survivors of the three A7V units had nominally been combined.

G2: STRIDSVAGEN M/21, STRIDSVAGON-BATALJON, SWEDISH ARMY, 1928

The Stridsvagen m/21 was originally finished in dark gray but by the end of the decade had adopted a new camouflage scheme of dark green, brown, and light sand colors with black separation lines, somewhat similar to the German September 1918 scheme.

Panzer 563 "Wotan" was the penultimate production example of the A7V and a good example of the final production batch, designed from the outset for the pedestal mounted 57mm gun. (NARA)



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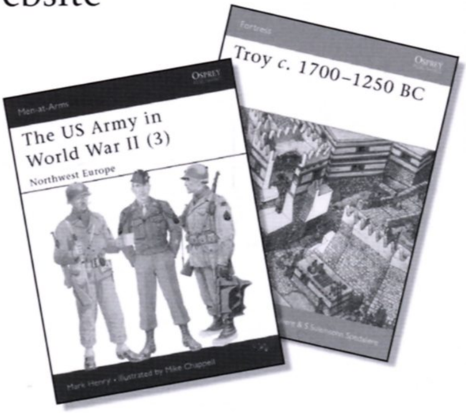
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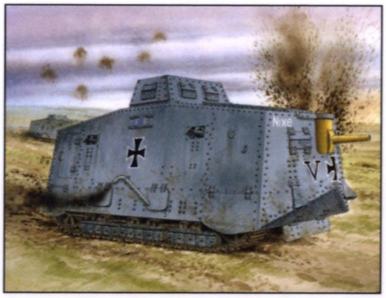

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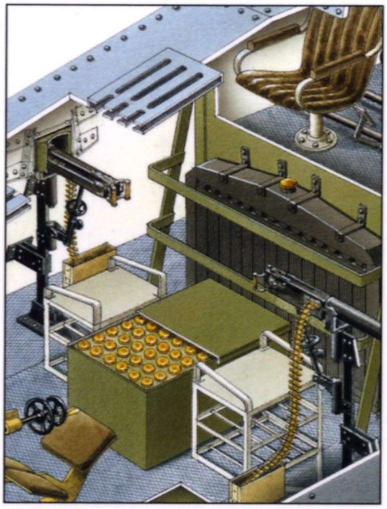

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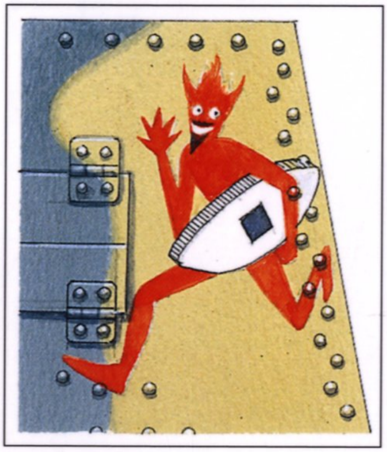

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